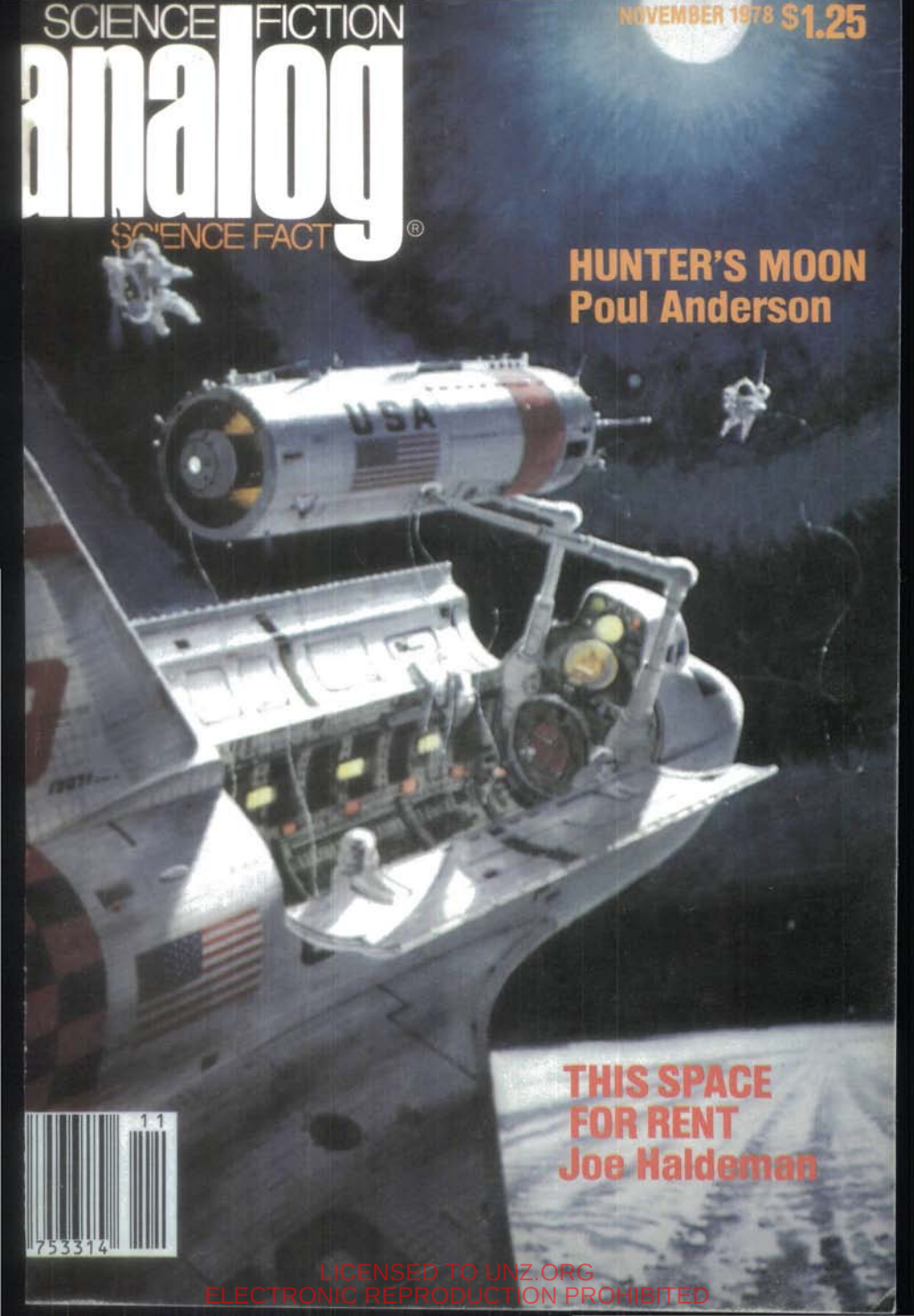

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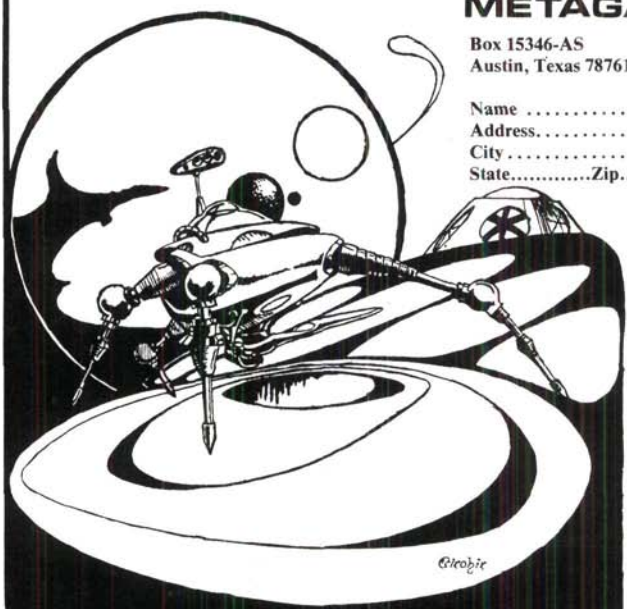

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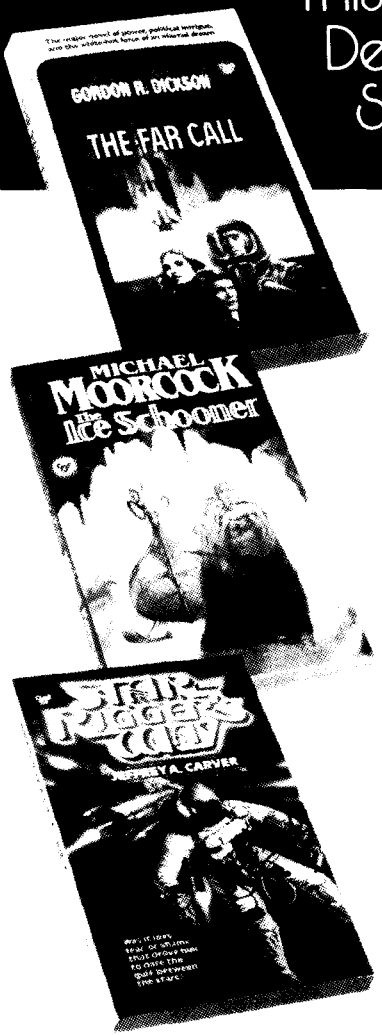

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aloha

This is my last Editorial for Analog.

Many of you already know that I have decided to resign the editorship of this magazine. To others, the news may come as a surprise. Although one of the characteristics of the science fiction community is the near-instant transmission of information, unfortunately the information is often garbled, not entirely correct, or based on rumor and hearsay.

So, like any good Jeffersonian with "a decent respect to the opinions of mankind," it is time to "let Facts be submitted to a candid world."

Many people are shocked at the thought of Analog's Editor voluntarily leaving his post. John W. Campbell's long tenure, ended only by his sudden and totally unexpected death, had created a tradition that Analog's Editor has a lifetime position.

I had never intended to make Analog—or any job other than my own writing career—my lifetime work. I accepted the Editorship of Analog because it was a challenge that no science fiction person could resist. I have remained at this job for almost seven years—and they have been very good years, for me. I have enjoyed every minute of my work here at Analog, and it has been my privilege to help keep this magazine at the forefront of the science fiction field.

I've had lots of help. Catherine Tarrant, Diana King, and Victoria Schochet have been marvelous associates. Herbert Stoltz, our Art Director, has

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been a real unsung hero; the distinctive "look" of Analog is due to his fine and patient work. The editorial assistants, and the backup organization of The Condé Nast Publications, Inc., have made it easy to keep this magazine running on an even keel.

The writers and illustrators—and there are far too many of them to name individually—are the ones who have really kept Analog at the forefront of the field. From the most veteran of the old pros to the neophytes who tremblingly sent their first stories or sketches to us, it is these contributors who make the Editor's life pleasurable, and the reader's life a joy.

But seven years in any one position is long enough. Even though I have been able to write novels and stories of my own while Editor, I have always wanted to be a fulltime writer.

On the other hand, I feel that I have accomplished as much here at Analog as I expected to. The magazine is prospering. Our contributors regularly collect Hugo and Nebula awards. The new line of Analog Books is off to a good start. We've also had some less-than-successful ventures, such as our cover reprint offers and our one Analog Record. But in general, the fears that I (and many others) had when John Campbell died in 1971 have been allayed: Analog is thriving, and Condé Nast intends to keep it so.

So it's time to bring on a new Editor and a fresh point of view. The new Editor will be Stanley Schmidt.

He is uniquely qualified for this unique task. Stan is a PhD physicist, a science fiction writer of the first caliber, a teacher. All of these qualifications are very important for the Editor of this magazine.

Stan Schmidt is no stranger to regular readers of Analog. His novelettes and serials have appeared here with great regularity; his most recent stories, the "Lifeboat Earth" series, will soon appear as a novel.

As an associate professor of physics at Heidelberg College (in Ohio, not Germany), Stan has also had the chance to teach a course in science fiction—and from firsthand experience, I can tell you he is one of the very few teachers who not only *knows* that subject, but knows how to teach it.

Teaching is an important part of the Editor's job. Analog has a long tradition of seeking and developing new writing talent. Stan Schmidt will enhance that tradition.

My own hopes to become at last a fulltime writer have not yet quite materialized, however. Through a rather strange set of circumstances, I have accepted the position of fiction editor of the new Guccione science fiction-and-fact magazine, Omni.

I would like to have it clearly understood, though, that my decision to leave Analog was made before I was asked to take on the Omni job. The Guccione people did not "hire me away" from Analog.

My main intention is still to be a fulltime writer. There are a couple of rather large novels boiling around in-

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side my head, and I want to get them down on paper. For the time being, though, writing them will continue to be a part-time occupation.

Still, I will be writing. And, who knows, perhaps the new Editor of Analog may even buy a couple of my stories! That would be delightful. It's been a long time since my fiction has appeared here. I've missed that. My deepest regret was that John Campbell died before I had a chance to submit *Millennium* to him for serialization. We had talked about the novel, and he had made his usual fourteen dozen good suggestions about it. I never got the chance to see his appraisal of the *finished product*.

One final word to you readers. You are the most cantankerous, nitpicking, vociferous, and exasperating audience I've ever known or heard of. Nobody outside the science fiction world can imagine what an argumentative bunch of inspectors-general you are. Thanks for that, from the bottom of my soul. You've been marvelous. No editor could have a more loyal or a better audience.

You're going to be tempted to blame Stanley Schmidt for some of my decisions, since his first few issues will have a lot of my story selections in them.

Please be just as didactic and impatient with him as you have been with me! That's what makes this job really *fun*.

Bless you all. Aloha.

BEN BOVA

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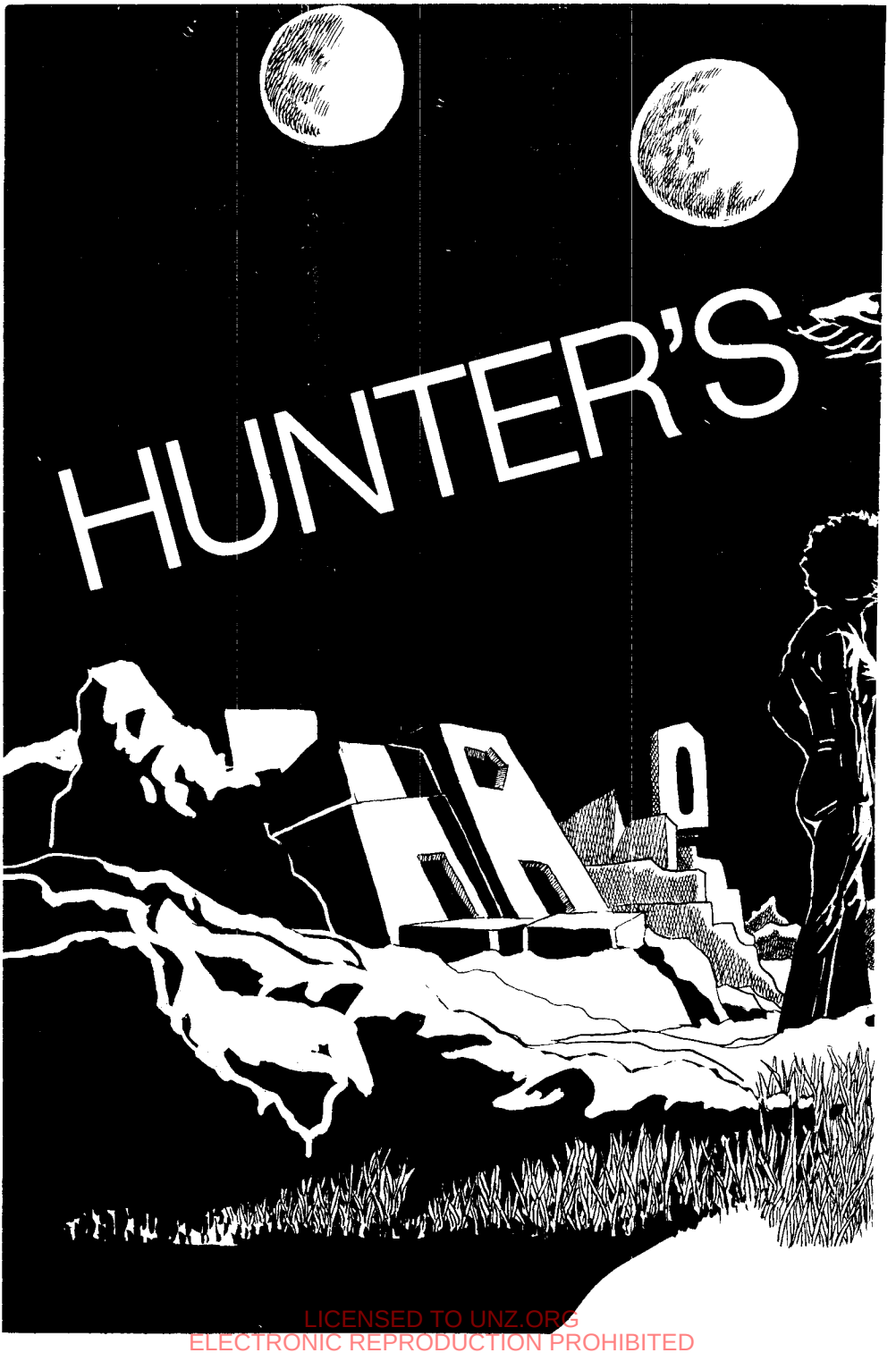

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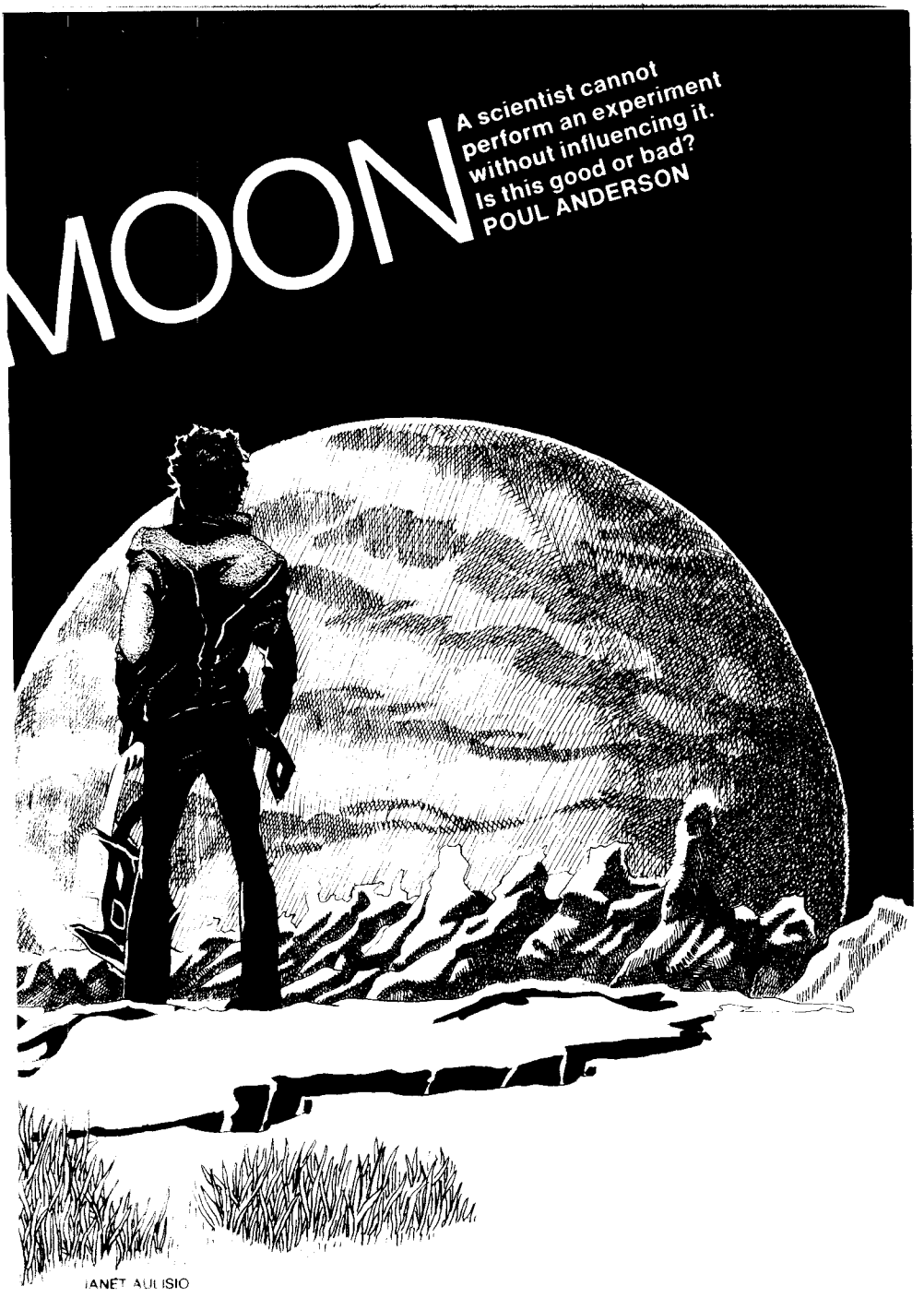
MOON

A scientist cannot perform an experiment without influencing it. Is this good or bad?

POUL ANDERSON



JANET AULISIO

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We do not perceive reality, we conceive it. To suppose otherwise is to invite catastrophic surprises. The tragic nature of history stems in large from this endlessly recurrent mistake.
—Oskar Haeml, *Betrachtungen über die menschliche Verlegenheit*

*** Both suns were now down. The western mountains had become a wave of blackness, unstirring, as though the cold of Beyond had touched and frozen it even as it crested, a first sea barrier on the flightway to the Promise; but heaven stood purple above, bearing the earliest stars and two small moons, ocher edged with silvery crescents, like the Promise itself. Eastward, the sky remained blue. There, just over the ocean, Ruii was almost fully lighted, Its bands turned luminous across Its crimson glow. Beneath the glade that It cast, the waters shivered, wind made visible.

A'i'ach felt the wind too, cool and murmurous. Each finest hair on his body responded. He needed but little thrust to hold his course, enough effort to give him a sense of his own strength and of being at one, in travel and destination, with his Swarm. Their globes surrounded him, palely iridescent, well-nigh hiding from him the ground over which they passed; he was among the highest up. Their lifescents overwhelmed all else which the air bore, sweet, heady, and they were singing together, hundreds of voices in chorus, so that their spirits might mingle and become Spirit, a foretaste of what awaited them in the far west. Tonight, when P'a crossed the face of Ruii, there would return the Shining Time. Already they rejoiced in the raptures ahead.

A'i'ach alone did not sing, nor did he lose more than a part of himself in dreams of feast and love. He was too aware of what he carried. The thing that the human had fastened to him weighed very little, but what it was putting into his soul was heavy and harsh. The whole Swarm knew about the dangers of attack, of course, and many clutched weapons—stones to drop or sharp-pointed branches shed by ü trees—in the tendrils that streamed under their globes. A'i'ach had a steel knife, his price for letting the human burden him. Yet it was not in the nature of the People to dread what might sink down upon them out of the future. A'i'ach was strangely changed by that which went on inside him.

The knowledge had come, he knew not how, slowly enough that he was not astonished by it. Instead, a grimness had meanwhile congealed. Somewhere in those hills and forests, a Beast ran that bore the same thing he did, that was also in ghostly Swarm-touch with a human. He could not guess what this might portend, save trouble of some kind for the People. He might well be unwise to ask. Therefore he had come to a resolve he realized was alien to his race: he would end the menace.

Since his eyes were set low on his body, he could not see the object secured on top, nor the radiance beam-

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ing upward from it. His companions could, though, and he had gotten a demonstration before he agreed to carry it. The beam was faint, faint, visible only at night and then only against a dark background. He would look for a shimmer among shadows on the land. Sooner or later, he would come upon it. The chance was not bad now at this, the Shining Time, when the Beasts would seek to kill People they knew would be gathered in vast numbers to revel.

A'i'ach had wanted the knife as a curiosity of possible usefulness. He meant to keep it in the boughs of a tree; when the mood struck him, he would experiment with it. A Person did once in a while employ a chance-found object, such as a sharp pebble, for some fleeting purpose, such as scooping open a crestflower pod to release its delicious seedlets upon the air. Perhaps with a knife he could shape wood into tools and have a stock of them always ready.

Given his new insight, A'i'ach saw what the blade was truly for. He could smite from above till a Beast was dead—no, *the* Beast.

A'i'ach was hunting. ***

Several hours before sundown, Hugh Brocket and his wife, Jannika Rezek, had been preparing for their night's work when Chrisoula Gryparis arrived, much overdue. A storm had first grounded aircraft at Enrique and then, perversely moving west, forced her into a long detour on her way to Hansonia. She didn't even see the Ring Ocean until she had traversed a good thousand kilometers of mainland, whereafter she must bend southward an equal distance to reach the big island.

"How lonely Port Kato looks from the air," she remarked. Though accented, her English—the agreed-upon common language at this particular station—was fluent: one reason she had come here to investigate the possibility of taking a post.

"Because it is," Jannika answered in her different accent. "A dozen scientists, twice as many juniors, and a few support personnel. That makes you extra welcome."

"What, do you feel isolated?" Chrisoula wondered. "You can call to anywhere on Nearside that there is a holocom, can you not?"

"Yeah, or flit to a town on business or vacation or whatever," Hugh said. "But no matter how stereo an image is and sounds, it's only an image. You can't go out with it for a drink after your conference is finished, can you? As for an actual visit, well, you're soon back here among the same old faces. Outposts get pretty ingrown socially. You'll find out, if you sign on." In haste: "Not that I'm trying to discourage you. Jan's right, we'd be more than happy to have somebody fresh join us."

His own accent was due to history. English was his mother tongue, but he was third-generation Medean, which meant that his grandparents had left North America so long ago that speech back there had changed like

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everything else. To be sure, Chrisoula wasn't exactly up-to-date, when a laser beam took almost fifty years to go from Sol to Colchis and the ship in which she had fared, unconscious and unaging, was considerably slower than that . . .

"Yes, from Earth!" Jannika's voice glowed.

Chrisoula winced. "It was not happy on Earth when I left. Maybe things got better afterward. Please, I will talk about that later, but now I would like to look forward."

Hugh patted her shoulder. She was fairly pretty, he thought: not in a class with Jan, which few women were, but still, he'd enjoy it if acquaintance developed bedward. Variety is the spice of wife.

"You really have had bad luck today, haven't you?" he murmured. "Getting delayed till Roberto—uh, Dr. Venosta went out in the field—and Dr. Feng back to the Center with a batch of samples—" He referred to the chief biologist and the chief chemist. Chrisoula's training was in biochemistry; it was hoped that she, lately off the latest of the rare starcraft, would contribute significantly to an understanding of life on Medea.

She smiled. "Well, then I will know others first, starting with you two nice people."

Jannika shook her head. "I am sorry," she said. "We are busy ourselves, soon to leave, and may not return until sunrise."

"That is—how long? About thirty-six hours? Yes. Is that not long to be away in . . . what do you say? . . . this weird an environment?"

Hugh laughed. "It's the business of a xenologist, which we both are," he said. "Uh, I think I, at least, can spare a little time to show you around and introduce you and make you feel sort of at home." Arriving as she did at a point in the cycle of watches when most folk were still asleep, Chrisoula had been conducted to his and Jannika's quarters. They were early up, to make ready for their expedition.

Jannika gave him a hard glance. She saw a big man who reckoned his age at forty-one Terrestrial years: burly, a trifle awkward in his movements, beginning to show a slight paunch; craggy-featured, sandy-haired, blue-eyed; close-cropped, clean-shaven, but sloppily clad in tunic, trousers, and boots, the style of the miners among whom he had grown up. "*I* have not time," she stated.

Hugh made an expansive gesture. "Sure, you just continue, dear." He took Chrisoula under the elbow. "Come on, let's wander."

Bewildered, she accompanied him out of the cluttered hut. In the compound, she halted and stared about her as if this were her first sight of Medea.

Port Kato was indeed tiny. Not to disturb regional ecology with things like ultraviolet lamps above croplands and effluents off them, it drew its necessities from older and larger settlements on the Nearside mainland. Moreover, while close to the eastern edge of Hansonia, it stood a few kilo-

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meters inland, on high ground, as a precaution against Ring Ocean tides which could get monstrous. Thus nature walled and roofed and weighed on the huddle of structures, wherever she looked—or listened, smelled, touched, tasted, moved. In slightly lesser gravity than Earth's, she had a bound to her step. The extra oxygen seemed to lend energy likewise, though her mucous membranes had not yet quite stopped smarting. Despite a tropical location, the air was balmy and not overly humid, for the island lay close enough to Farside to be cooled. It was full of pungencies, only a few of which she could remotely liken to anything familiar, such as musk or iodine. Foreign too were sounds—rustlings, trills, croakings, mumbles—which the dense atmosphere made loud in her ears.

The station itself had an outlandish aspect. Buildings were made of local materials to local design; even a radiant energy converter resembled nothing at home. Multiple shadows carried peculiar tints; in fact, every color was changed in this ruddy light. The trees that reared above the roof were of odd shapes, their foliage in hues of orange, yellow, and brown. Small things flitted among them or scuttled along their branches. Occasional glittery drifts in the breeze did not appear to be dust.

The sky was deep-toned. A few clouds were washed with faint pink and gold. The double sun Colchis—Castor C was suddenly too dry a name—was declining westward, both members so dim that she could safely gaze at them for a short while, Phrixus at close to its maximum angular separation from Helle.

Opposite them, Argo dominated heaven, as always on the inward-facing hemisphere of Medea. Here the primary planet hung low; treetops hid part of the great flattened disc. Daylight paled the redness of its heat, which would be lurid after dark. Nonetheless it was a colossus, as broad to the eye as fifteen or sixteen Lunas above Earth. The subtly chromatic bands and spots upon its face, everchanging, were clouds more huge than continents and hurricane vortices that could have swallowed whole this moon upon which she stood.

Chrisoula shivered. "It . . . strikes me," she whispered, "more than anywhere around Enrique or—or approaching from space . . . I have come elsewhere in the universe."

Hugh laid an arm around her waist. Not being a glib man otherwise, he merely said, "Well this *is* different. That's why Port Kato exists, you know. To study in depth an area that's been isolated awhile; they tell me the isthmus between Hansonia and the mainland disappeared fifteen thousand years ago. The local dromids, at least, never heard of humans before we arrived. The ouranids did get rumors, which may have influenced them a little, but surely not much."

"Dromids—ouranids—oh." Being Greek, she caught his meanings at once. "Fuxes and balloons, correct?"

Hugh frowned. "Please. Those are

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pretty cheap jokes, aren't they? I know you hear them a lot in town, but I think both races deserve more dignified names from us. They are intelligent, remember."

"I am sorry."

He squeezed a trifle. "No harm done, Chris. You're new. With a century needed for question and answer, between here and Earth—"

"Yes. I have wondered if it is really worth the cost, planting colonies beyond the Solar System just to send back scientific knowledge that slowly."

"You've got more recent information about that than I do."

"Well . . . the planetology, biology, chemistry, they were still giving new insights when I left, and this was good for everything from medicine to volcano control." The woman straightened. "Perhaps the next step is in your field, xenology? If we can come to understand a nonhuman mind—no, two, on this world—maybe three, if there really are two quite unlike sorts of ouranid as I have heard theorized —" She drew breath. "Well, then we might have a chance of understanding ourselves." He thought she was genuinely interested, not merely trying to please him, when she went on: "What is it you and your wife do? They mentioned to me in Enrique it is quite special."

"Experimental, anyway." Not to overdo things, he released her. "A complicated story. Wouldn't you rather take the grand tour of our metropolis?"

"Later I can by myself, if you must go back to work. But I am fascinated by what I have heard of your project. Reading the minds of aliens!"

"Hardly that." Seeing his opportunity, he indicated a bench outside a machine shed. "If you really would like to hear, sit down."

As they did, Piet Marais, botanist, emerged from his cabin. To Hugh's relief, he simply greeted them before hurrying off. Certain Hansonian plants did odd things at this time of day. Everyone else was still indoors, the cook and bull cook making breakfast, the rest washing and dressing for their next wakeful period.

"I suppose you are surprised," Hugh commenced. "Electronic neuranalysis techniques were in their infancy on Earth when your ship left. They took a spurt soon afterward, and of course the information reached us before you did. The use there had been on lower animals as well as humans, so it wasn't too hard for us—given a couple of geniuses in the Center—to adapt the equipment for both dromids and ouranids. Both those species have nervous systems too, after all, and the signals are electrical. Actually, it's been more difficult to develop the software, the programs, than the hardware. Jannika and I are working on that, collecting empirical data for the psychologists and semanticians and computer people to use.

"Uh, don't misunderstand, please. To *us*, this is nearly incidental. Mindscan—bad word, but we seem to be

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stuck with it—mindscan should eventually be a valuable tool in our real job, which is to learn how local natives live, what they think and feel, everything about them. However, at present it's very new, very limited, and very unpredictable."

Chrisoula tugged her chin. "Let me tell you what I imagine I know," she suggested, "then you tell me how wrong I am."

"Sure."

She grew downright pedantic: "Synapse patterns can be identified and recorded which correspond to motor impulses, sensory inputs, their processing—and at last, theoretically, to thoughts themselves. But the study is a matter of painfully accumulating data, interpreting them, and correlating the interpretations with verbal responses. Whatever results one gets, they can be stored in a computer program as an *n*-dimensional map off which readings can be made. More readings can be gotten by interpolation."

"Whe-ew!" the man exclaimed. "Go on."

"I am right this far? I did not expect to be."

"Well, naturally, you're trying to sketch in a few words what needs volumes of math and symbolic logic to describe halfway properly. Still, you're doing better than I could myself."

"I continue. Now recently there are systems which can make correspondences between different maps. They can transform the patterns that constitute thought in one mind into the thought-patterns of another. Also, direct transmission between nervous systems is possible. A pattern can be detected, passed through a computer for translation, and electromagnetically induced in a receiving brain. Does this not amount to telepathy?"

Hugh started to shake his head, but settled for: "M-m-m, of an extremely crude sort. Even two humans who think in the same language and know each other inside out, even they get only partial information—simple messages, burdened with distortion, low signal-to-noise ratio, and slow transmission. How much worse when you try with a different life form! The variations in speech alone, not to mention neurological structure, chemistry—"

"Yet you are attempting it, with some success, I hear."

"Well, we made a certain amount of progress on the mainland with both dromids and ouranids. But believe me, 'certain amount' is a gross overstatement."

"Next you are trying it on Hansonia, where the cultures must be entirely strange to you. In fact, the species of ouranid—Why? Do you not add needlessly to your difficulties?"

"Yes—that is, we do add countless problems, but it is not needless. You see, most cooperating natives have spent their whole lives around humans. Many of them are professional subjects of study: dromids for material pay, ouranids for psychological satisfaction, amusement, I suppose you could say. They're deracinated; they

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themselves often don't have any idea why their 'wild' kinfolk do something. We wanted to find out if mindscan can be developed into a tool for learning about more than neurology. For that, we needed beings who're relatively, uh, uncontaminated. Lord knows Nearside is full of virgin areas. But here Port Kato already was, set up for intensive study of a region that's both isolated and sharply defined. Jan and I decided we might as well include mindscan in our research program."

Hugh's glance drifted to the immensity of Argo and lingered. "As far as we're concerned," he said low, "it's incidental—one more way for us to try and find out why the dromids and ouranids here are at war."

"They kill each other elsewhere too, do they not?"

"Yes, in a variety of ways, for a larger variety of reasons, as nearly as we can determine. Let me remark for the record, I myself don't hold with the theory that information on this planet can be acquired by eating its possessor. For one thing, I can show you more areas than not where dromids and ouranids seem to coexist perfectly peacefully." Hugh shrugged. "Nations on Earth never were identical. Why should we expect Medea to be the same everywhere?"

"On Hansonia, however—you say war?"

"Best word I can think of. Oh, neither group has a government to issue a formal declaration. But the fact is that more and more, for the past couple of decades—as long as humans have been observing, if not longer—dromids on this island have been hellbent to kill ouranids. Wipe them out! The ouranids are pacifistic, but they do defend themselves, sometimes with active measures like ambushes." Hugh grimaced. "I've glimpsed several fights, and examined the results of a lot more. Not pleasant. If we in Port Kato could mediate—bring peace—well, I'd think that alone might justify man's presence on Medea."

While he sought to impress her with his kindliness, he was not hypocritical. A pragmatist, he had nevertheless wondered occasionally if humans had a right to be here. Long-range scientific study was impossible without a self-supporting colony, which in turn implied a minimum population, most of whose members were not scientists. He, for example, was the son of a miner and had spent his boyhood in the outback. True, settlement was not supposed to increase beyond its present level, and most of this huge moon was hostile enough to his breed that further growth did seem unlikely. But—if nothing else, simply by their presence, Earthlings had already done irreversible things to both native races.

"You cannot ask them why they fight?" Chrisoula wondered.

Hugh smiled wryly. "Oh, sure, we can ask. By now we've mastered local languages for everyday purposes. Except, how deep does our understanding go?

"Look, I'm the dromid specialist, she's the ouranid specialist, and we've

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both worked hard trying to win the friendship of specific individuals. It's worse for me, because dromids won't come into Port Kato as long as ouranids might show up anytime. They admit they'd be duty bound to try and kill the ouranids—and eat them, too, by the way; that's a major symbolic act. The dromids agree this would be a violation of our hospitality. Therefore I have to go meet them in their camps and dens. In spite of this handicap, she doesn't feel she's progressed any further than me. We're equally baffled."

"What do the autochthons *say*?"

"Well, either species admits they used to live together amicably . . . little or no direct contact, but with considerable interest in each other. Then, twenty or thirty years back, more and more dromids started failing to reproduce. Oftener and oftener, castoff segments don't come to term, they die. The leaders have decided the ouranids are at fault and must be exterminated."

"Why?"

"An article of faith. No rationale that I can untangle, though I've guessed at motivations, like the wish for a scapegoat. We've got pathologists hunting for the real cause, but imagine how long that might take. Meanwhile, the attacks and killings go on."

Chrisoula regarded the dusty ground. "Have the ouranids changed in any way? The dromids might then jump to a conclusion of *post hoc, propter hoc*."

"Huh?" When she had explained, Hugh laughed. "I'm not a cultivated type, I'm afraid," he said. "The rock rats and bush rangers I grew up amongst do respect learning—we wouldn't survive on Medea without learning—but they don't claim to have a lot of it themselves. I got interested in xenology because as a kid I acquired a dromid friend and followed her-him through the whole cycle, female to male to postsexual. It grabbed hold of my imagination—a life that exotic."

His attempt to turn the conversation into personal channels did not succeed. "What have the ouranids done?" she persisted.

"Oh . . . they've acquired a new—no, not a new religion. That implies a special compartment of life, doesn't it? And ouranids don't compartmentalize their lives. Call it a new Way, a new *Tao*. It involves eventually riding an east wind off across the ocean, to die in the Farside cold. Somehow, that's transcendental. Please don't ask me how, or why. Nor can I understand—or Jan—why the dromids consider this is such a terrible thing for the ouranids to do. I have some guesses, but they're only guesses. She jokes that they're born fanatics."

Chrisoula nodded. "Cultural abysses. Suppose a modern materialist with little empathy had a time machine, and went back to the Middle Ages on Earth, and tried to find out what drove a Crusade or Jihad. It would appear senseless to him. Doubtless he would conclude everybody concerned was crazy, and the sole possible way to peace was total victory of one

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side or the other. Which was not true, we know today."

The man realized that this woman thought a good deal like his wife. She continued: "Could it be that human influences have brought about these changes, perhaps indirectly?"

"It could," he admitted. "Ouranids travel widely, of course, so those on Hansonia may well have picked up, at second or third hand, stories about Paradise which originated with humans. I suppose it'd be natural to think Paradise lies in the direction of sunset. Not that anybody has ever tried to convert a native. But natives have occasionally inquired what our ideas are. And ouranids are compulsive mythmakers, who might seize on any concept. They're ecstatics, too. Even about death."

"While dromids are prone to develop militant new religions overnight, I have heard. On this island, then, a new one happens to have turned against the ouranids, no? Tragic—though not unlike persecutions on Earth, I expect."

"Anyhow, we can't help till we have a lot more knowledge. Jan and I are trying for that. Mostly, we follow the usual procedures, field studies, observations, interviews, et cetera. We're experimenting with mindscan as well. Tonight it gets our most thorough test yet."

Chrisoula sat upright, gripped. "What will you do?"

"We'll draw a blank, probably. You're a scientist yourself, you know how rare the real breakthroughs are. We're only slogging along."

When she remained silent, Hugh filled his lungs for talk. "To be exact," he proceeded, "Jan's been cultivating a 'wild' ouranid, I a 'wild' dromid. We've persuaded them to wear miniaturized mindscan transmitters, and have been working with them to develop our own capability. What we can receive and interpret isn't much. Our eyes and ears give us a lot more information. Still, this is special information. Supplementary.

"The actual layout? Oh, our native wears a button-sized unit glued onto the head, if you can talk about the head of an ouranid. A mercury cell gives power. The unit broadcasts a recognition signal on the radio band—microwatts, but ample to lock onto. Data transmission naturally requires plenty of bandwidth, so that's on an ultraviolet beam."

"What?" Chrisoula was startled. "Isn't that dangerous to the dromids? I was taught they, most animals, have to take shelter when a sun flares."

"This is safely weak, also because of energy limitations," Hugh replied. "Obviously, it's limited to line-of-sight and a few kilometers through air. At that, natives of either kind tell us they can spot the fluorescence of gas along the path. Not that they describe it in such terms!

"So Jan and I go out in our separate aircraft. We hover too high to be seen, activate the transmitters by a signal, and 'tune in' on our individual subjects through our amplifiers and computers. As I said, to date we've gotten extremely limited results; it's a mighty

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poor kind of telepathy. This night we're planning an intensive effort, because an important thing will be happening."

She didn't inquire immediately what that was, but asked instead: "Have you ever tried sending to a native, rather than receiving?"

"What? No, nobody has. For one thing, we don't want them to know they're being scanned. That would likely affect their behavior. For another thing, no Medeans have anything like a scientific culture. I doubt they could comprehend the idea."

"Really? With their high metabolic rate, I should guess they think faster than us."

"They seem to, though we can't measure that till we've improved mindscan to the point of decoding verbal thought. All we've identified thus far is sensory impressions. Come back in a hundred years and maybe someone can tell you."

The talk had gotten so academic that Hugh positively welcomed the diversion when an ouranid appeared. He recognized the individual in spite of her being larger than usual, her globe distended with hydrogen to a full four meters of diameter. This made her fur sparse across the skin, taking away its mother-of-pearl sheen. Just the same, she was a handsome sight as she passed the treetops, crosswind and then downward. Prehensile tendrils streaming below in variable configurations, to help pilot a jet-propelled swim through the air, she hardly deserved the name "flying jellyfish"—though he had seen pictures of Earthside Portuguese men-of-war and thought them beautiful. He could sympathize with Jannika's attraction to this race.

He rose. "Meet a local character," he invited Chrisoula. "She has a little English. However, don't expect to understand her pronunciation at once. Probably she's come to make a quick swap before she rejoins her group for the big affair tonight."

The woman got up. "Swap? Exchange?"

"Yeah. Niallah answers questions, tells legends, sings songs, demonstrates maneuvers, whatever we request. Afterward we have to play human music for her. Schönberg, usually; she dotes on Schönberg."

—Loping along a clifftop, Erakoum spied Sarhouth clearly against Mardudek. The moon was waxing toward solar fullness as it crossed that coal-glow. Its disc was dwarfed by the enormous body behind, was actually smaller to the eye than the spot which also passed in view, and its cold luminance had well-nigh been drowned earlier when it moved over one of the belts which changeably girded Mardudek. They grew bright after dark, those belts; thinkers like Yasari believed they cast back the light of the suns.

For an instant, Erakoum was captured by the image, spheres traveling through unbounded spaces in circles within circles. She hoped to become a thinker herself. But it could not be

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soon. She still had her second breeding to go through, her second segment to shed and guard, the young that it presently brought forth to help rear; and then she would be male, with begetting of her own to do—before that need faded out likewise and there was time for serenity.

She remembered in a stab of pain how her first birthing had been for naught. The segment staggered about weakly for a short while, until it lay down and died as so many were doing, so many. The Flyers had brought that curse. It had to be them, as the Prophet Illdamen preached. Their new way of faring west when they grew old, never to return, instead of sinking down and rotting back into the soil as Mardudek intended, surely angered the Red Watcher. Upon the People had been laid the task of avenging this sin against the natural order of things. Proof lay in the fact that females who slew and ate a Flyer shortly before mating always shed healthy segments which brought forth live offspring.

Erakoum swore that tonight she was going to be such a female.

She stopped for breath and to search the landscape. These precipices rimmed a fjord whose waters lay more placid than the sea beyond, brilliant under the radiance from the east. A dark patch bespoke a mass of floating weed. Might it be plants of the kind from which the Flyers budded in their abominable infancy? Erakoum could not tell at her distance. Sometimes valiant members of her race had ventured out on logs, trying to reach those beds and destroy them; but they had failed, and often drowned, in treacherous great waves.

Westward rose rugged, wooded hills where darkness laired. Athwart their shadows, sparks danced glittering golden, by the thousands—the millions, across the land. They were firemites. Through more than a hundred days and nights, they had been first eggs, then worms, deep down in forest mould. Now Sarhouth was passing across Mardudek in the exact path that mysteriously summoned them. They crept to the surface, spread wings which they had been growing, and went aloft, agleam, to mate.

Once it had meant no more to the People than a pretty sight. Then the need came into being, to kill Flyers . . . and Flyers gathered in hordes to feed on yonder swarms. Hovering low, careless in their glee, they became more vulnerable to surprise than they commonly were. Erakoum hefted an obsidian-headed javelin. She had five more lashed across her back. A number of the People had spent the day setting out nets and snares, but she considered that impractical; the Flyers were not ordinary winged quarry. Anyhow, she wanted to fling a spear, bring down a victim, sink fangs into its thin flesh, herself!

The night muttered around her. She drank odors of soil, growth, decay, nectar, blood, striving. Warmth from Mardudek streamed through a chill breeze to lave her pelt. Half-glimpsed flitting shapes, half-heard as they rustled the brush, were her fellows. They

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were not gathered into a single company, they coursed as each saw fit, but they kept more or less within earshot, and whoever first saw or winded a Flyer would signal it with a whistle.

Erakoum was farther separated from her nearest comrade than any of them were. The others feared that the light-beam reaching upward from the little shell on her head would give them away. She deemed it unlikely, as faint as the bluish gleam was. The human called Hugh paid her well in trade goods to wear the talisman whenever he asked and afterward discuss her experiences with him. For her part, she knew a darkling thrill at such times, akin to nothing else in the world, and knowledge came into her, as it through dreams but more real. These gains were worth a slight handicap on an occasional hunt . . . even tonight's hunt.

Moreover. There was something she had not told Hugh, because he had not told her earlier. It was among the things she learned without words from the gleam-shell. A certain Flyer also carried one, which also kept it in eldritch contact with a human.

The big grotesque creatures were frank about being neutral in the strike between People and Flyers. Erakoum did not hold that against them. This was not their home, and they could not be expected to care if it grew desolate. Yet she had shrewdly deduced that they would try to keep in its burrow their equal intimacy with members of both breeds.

If Hugh had been anxious for her to be soul-tied to him this night, doubtless another human wanted the same for a Flyer. It would be a special joy to her to bring that one down. Besides, looking as she fared for a pale ray among firemites and stars might lead her toward a whole pack of enemies. Rested, she began to trot inland.

Erakoum was hunting.—

Jannika Rezek was forever homesick for a land where she had never lived.

Her parents had politically offended the government of the Danubian Federation. It informed them they need not enter a reindoctrination hospice if they would volunteer to represent their country in the next shipful of personnel to Medea. That was scarcely a choice. Nevertheless, her father told her afterward that his last thought, as he sank down into suspended animation, was of the irony that when he awakened, none of his judges would be alive and nobody would remember what his opinions had been, let alone care. As a matter of fact, he learned at his goal that there was no longer a Danubian Federation.

The rule remained in force that, except for crewfolk, no person went in the opposite direction. A trip was too expensive for a passenger to be carried who would land on Earth as a useless castaway out of past history. Husband and wife made the best they could of their exile. Both physicians, they were eagerly received in Armstrong and its agricultural hinterland. By the modest standards of Medea, they prospered,

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finally winning a rare privilege. The human population had now been legally stabilized. More would overcrowd the limited areas suitable for settlement, as well as wreaking havoc on environments which the colony existed to study. To balance reproductive failures, a few couples per generation were allowed three children. Jannika's folk were among these.

Thus everybody, herself perforce included, reckoned hers a happy childhood. It was a highly civilized one, too. In the molecules of reels kept at the Center was stored most of mankind's total culture. Industry was, at last, sufficiently developed that well-to-do families could have sets which retrieved the data in as full hologrammic and stereophonic detail as desired. Her parents took advantage of this to ease their nostalgia, never thinking what it might do to younger hearts. Jannika grew up among vivid ghosts: old towers in Prague, springtime in the Böhmerwald, Christmas in a village which centuries had touched only lightly, a concert hall where music rolled in glory across a festive-clad audience which outnumbered the dwellers in Armstrong, replications of events which once made Earth tremble, songs, poetry, books, legends, fairy tales. . . . She sometimes wondered if she had gone into xenology because the ouranids were light bright, magical beings in a fairy tale.

Today, when Hugh led Chrisoula outside, she had stood for a moment staring after them. Abruptly the room pressed in as if to choke her. She had done what she could in the way of brightening it with drapes, pictures, keepsakes. At present, however, it was bestrewn with field gear; and she hated disorder. He cared naught.

The question rose afresh: How much did he care at all, any longer? They were in love when they married, yes, of course, but even then she recognized it was in high degree a marriage of convenience. Both were after appointments to an outpost station where they would maximize their chances of doing really significant, original research. Wedded couples were preferred, on the theory that they would be less distracted from their work than singletons. When they had their first babies, they were customarily transferred to a town.

She and Hugh quarreled about that. Social pressure—remarks, hints, embarrassed avoidance of the subject—was mounting on them to reproduce. Within population limits, it was desirable to keep the gene pool as large as possible. She was getting along in age, a bit, for motherhood. He was more than willing. But he took for granted that *she* would maintain the home, hold down the desk job, while *he* continued in the field. . . .

She must not reprove him when he came back from his flirtatious little stroll. She lost her temper too often these days, grew outright shrewish, till he stormed from the hut or else grabbed the whiskey and started glugging. He was not a bad man—at the core, he was a good man, she amended hastily—thoughtless in many ways

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but well-meaning. At her time of life, she couldn't likely do any better.

Although — She felt the heat in her cheeks, made a gesture as if to fend off the memory, and failed. It was two days old.

Having learned from A'i'ach about the Shining Time, she wanted to gather specimens of the glitterbug larvae. Hitherto humans had merely known that the adult insectoids swarmed aloft at intervals of approximately a year. If that was important to the inhabitants of Hansonia, she ought to know more. Observe for herself, enlist the aid of biologists, ecologists, chemists— She asked Piet Marais where to go, and he offered to come along. "The idea should have occurred to me before," he said. "Living in humus, the worms must influence plant growth."

Moister soil was required than existed at Port Kato. They went several kilometers to a lake. The walking was easy, for dense foliage overhead inhibited underbrush. Softness muffled footfalls, trees formed high-arched naves, multiple rays of light passed through dusk and fragrances to fleck the ground or glance off small wings, a sound as of lyres rippled from an unseen throat.

"How delightful," Piet said after a while.

He was looking at her, not ahead. She became very conscious of his blond handsomeness. And his youth, she reminded herself, he was her junior by well-nigh a decade, though mature, considerate, educated, wholly a man. "Yes," she blurted. "I wish I could appreciate it as you do."

"It is not Earth," he discerned. She realized that her answer had been less noncommittal than intended.

"I wasn't pitying myself," she said fast. "Please don't think that. I do see beauty here, and fascination, and freedom, oh, yes, we're lucky on Medea." Attempting to laugh: "Why, on Earth, what would I have done for ouranids?"

"You love them, don't you?" he asked gravely. She nodded. He laid a hand on her bare arm. "You have a great deal of love in you, Jannika."

She made a confused effort to see herself through his eyes. Medium-sized, with a figure she knew was stunning; dark hair worn shoulder length, with gray streaks that she wished Hugh would insist were premature; high cheekbones, tilted nose, pointed chin, large brown eyes, ivory complexion. Still, though Piet was a bachelor, someone that attractive needn't be desperate, he could meet girls in town and keep up acquaintance by holocom. He shouldn't be this appreciative of her. She shouldn't respond. True, she'd had other men a few times, before and after she married. But never in Port Kato; too much likelihood of complications, and she'd been furious when Hugh got involved locally. Worse yet, she suspected Piet saw her as more than a possible partner in a frolic. That could break lives apart.

"Oh, look," she said, and disengaged from his touch in order to point at a cluster of seed pyramids. Meanwhile her mind came to the rescue. "I

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quite forgot, I meant to tell you, I got a call today from Professor al-Ghazi. We think we've found what makes the glitterbugs metamorphose and swarm."

"Eh?" He blinked. "I didn't realize anybody was working on that."

"Well, it was a, a notion that occurred to me after my special ouranid started me speculating about them. He, A'i'ach, I mean, he told me the time is not strictly seasonal—that is not necessary here in the tropics—but set by Jason—the moon," she added, because the name that humans had bestowed on the innermost of the larger satellites happened to resemble a word which humans had adopted, given by dromids in the Enrique area to an analog of the sirocco wind.

"He says the metamorphoses come during particular transits of Jason across Argo," she continued. "Roughly, every four hundredth. To be exact, the figure is every hundred and twenty-seven Medean days, plus or minus a trifle. The natives here are as keenly conscious of heavenly bodies as everywhere else. The ouranids make a festival of the swarming; they find glitterbugs delicious. Well, this gave me an idea, and I called the Center and requested an astronomical computation. It seems I was right."

"Astronomical cues, for a worm underground?" Marais exclaimed.

"Well, you doubtless recall how Jason excites electrical activity in the atmosphere of Argo, like Io with Jupiter—" the solar system, where Earth has her dwelling! "In this case, there's a beaming effect on one of the radio frequencies that are generated, a kind of natural maser. Therefore those waves only reach Medea when the two moons are on their line of nodes. And that is the exact period my friend was describing. The phase is right, too."

"But can the worms detect so weak a signal?"

"I think it is clear that they do. How, I cannot tell without help from specialists. Remember, though, Phrixus and Helle create little interference. Organisms can be fantastically sensitive. Did you know that it takes less than five photons to activate the visual purple in your eye? I suppose the waves from Argo penetrate the soil to a few centimeters' depth and trigger a chain of biochemical reactions. No doubt it is an evolutionary relic from a time when the orbits of Jason and Medea gave an exact match to the seasons. Perturbation does keep changing the movements of the moons, you know."

He was silent a while before he said: "I do know you are a most extraordinary person, Jannika."

She had regained enough equilibrium to control their talk until they reached the lake. There, for a moment, she felt herself shaken again.

A canebrake screened it from them till they had passed through, to halt on a beach carpeted with mosslike amber-hued turf. Untouched by man in its chalice of forest, the water lay scummy, bubbling, and odorous. The sight of soft colors and the smell of living things were not unpleasant; they were

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normal to Medea—yet how clear and silver blue the Neusiedler See gleamed in Danubia. Breath hissed between her teeth.

"What's wrong?" Piet followed her gaze. "The dromids?"

A party of them had arrived to drink, some distance off. Jannika stared as if she had never seen their kind before.

Nearest was a young adult, presumably virgin, since she had six legs. From the slender, long-tailed body rose a two-armed centauroid torso, up to the oddly vulpine head, which would reach to Jannika's chest. Her pelt shimmered blue-black under the suns; Argo was hidden by trees.

Four-legged, a trio of mothers kept watch on the eight cubs they had between them. One set of young showed by their size that their parent would soon ovulate again, be impregnated by a mating, shortly thereafter shed her second segment, and attend it until it gave birth. Another member of this group was at that stage of life, walking on two legs, no longer a functional female but with the male gonads still undeveloped.

No male of breeding age was present. Such a creature was too driven, lustful, impatient, violent, for sociability. There were three postsexual beings, grizzled but strong, protective, their biped movements fast by human standards though laggard compared to the lightning fluidity of their companions.

All adults were armed with stone-age spears, hatchets, and daggers, plus the carnivore teeth in their jaws.

They were gone almost as soon as Jannika had seen them, not out of fear but because they were Medean animals whose chemistry and living went swifter than hers.

"The dromids," she got out.

Piet regarded her awhile before he said gently: "They pursue your dear ouranids. You tell me that will get worse than ever on the night when the glitterbugs rise. But you must not hate them. They are caught in a tragedy."

"Yes, the sterility problem, yes. Why should they drag the ouranids down with them?" She struck fist into palm. "Let's get to work, let's collect our samples and go home, can we, please?"

He was fully understanding.

—She cast the memory out and flung herself back into preparations for the night.

Hugh Brocket and his wife departed a while after sunset. Their flitters jetted off in a whisper, reached an intermediate altitude, and circled for a minute while the riders got bearings and exchanged radioed farewells. Observed from below, catching the last gleam of sunken Colchis on their flanks, they resembled a pair of teardrops.

"Good hunting, Jan."

"Ugh! Don't say that."

"Sorry," he apologized in a stiff tone, and cut out the sender. Sure, it had been tactless of him, but why must she be so goddamn touchy?

Never mind. He'd plenty to do.

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Erakoum had promised to be on Shipwreck Cliffs about this time, since her gang meant to proceed north along the coast from its camp before turning inland. Thereafter her location would be unpredictable. He must lock onto her transmitter soon. Jannika's craft dwindled in sight, bound on her own quest. Hugh set his inertial pilot and settled back in his safety harness to double-check his instruments. That was mechanical, since he knew quite well everything was in order. Most of his attention roamed free.

The canopy gave a titanic vista. Below, hills lay in dappled masses of shadow, here and there relieved by an argent thread that was a river or by the upheaving of precipices and scarps. The hemisphere-dividing Ring Ocean turned the eastern horizon to quicksilver. Westward in heaven, the double sun had left a Tyrian wake. Overhead reached a velvety dark, becoming more starry with each of his heartbeats. He saw a pair of moons, close enough to show discs lighted from two sides, rusty and white; he recognized more, which were mere bright points to his eyes, by their positions as they went on sentry-go among the constellations. Low above the sea smoldered Argo—no, shone, because its upper clouds were in full daylight, bands of brilliance splashed over sullen red. Jason was close to transit, with angular diameter exceeding twenty minutes of arc, and nevertheless Hugh had trouble finding it amidst that glare.

The shore came in view. He activated the detector and set his craft to hovering. An indicator light flashed green; he had his contact. He sent the vehicle aloft, a full three kilometers. Partly this was because he would be concentrating on encephalic input and wanted plenty of room for piloting error; partly it was to keep beyond sight or hearing of the natives, lest his presence affect their actions. Having taken station, he connected and secured the receiver helmet to his head—it didn't weigh much—and switched it on. Transmitted, amplified, transformed, relayed, reinduced, the events in Erakoum's nervous system merged with the events in his.

By no means did he acquire the dromid's full awareness. Conveyance and translation were far too primitive. He had spent his professional lifetime gaining sufficient fellow-feeling with the species that, after as much patience as both individuals could maintain over a span of years, he could barely begin to interpret the signals he gathered. The speed of native mental processes was less of a help—through repetition and reinforcement—than an added hindrance. As a rough analogy, imagine trying to follow a rapid and nearly inaudible conversation, missing many a word, in a language you do not know well. Actually, none of what Hugh perceived was verbal; it was sight, sound, a complex of senses, including those interior like balance and hunger, including dream-hints of senses that he did not think he possessed.

He saw the land go by, bush, branch, slope, stars and moons above

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shaggy ridges; he felt its varying contours and textures as feet went pacing; he heard its multitudinous low noises; he smelled richness; the impressions were endless, most of them vague and fleeting, the best of them strong enough to take him out of himself, draw him groundward toward oneness with the creature below.

Clearest, perhaps because his glands were stimulated thereby, was emotion, determination. Erakoum was out to get herself a Flyer.

It was going to be a long night, quite possibly a harrowing one. Hugh expected he'd need a dose or two of sleep surrogate. Humans had never gotten away from the ancient rhythms of Earth. Dromids catnapped; ouranids went—daydreamy? contemplative?

As often before, he wondered brief-

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ly what Jan's rapport with her native felt like. They would never be able to describe their sharings to each other.

***Well into the hills, A'i'ach's Swarm found a grand harvest of starwings. The heights were less densely wooded than the lowlands, which was good, for the bright prey never went far up, and below a forest crown, the People were vulnerable to Beast attack. Here was a fair amount of open ground, turf-begrown and boulder-strewn, scattered through the shadowing timber. A narrow ravine crossed the largest of those glades, a gash abrim with blackness.

Like an endless shower of sparks, the starwings danced, dashed, dodged about, beyond counting, meant for naught save the ecstasy of their mating and of the People who fed upon them. Despite the wariness in him, A'i'ach could resist no more than anyone else. He did refrain from valving out gas in his haste to descend, as many did. That would make ascent slow. Instead, he contracted his globe and sank, letting it reexpand slightly as varying air densities demanded. Nor did he release gas to propel himself. Rhythmically pumping, his siphon worked together with the breezes to zigzag him about at low speed. There was no hurry. The starwings numbered more than the Swarm could eat. Plenty would go free to lay their eggs for the next crop.

Among the motes, A'i'ach inhaled his first swallow of them. The sweet hot flavor sang in his flesh. Thickly gathered around him, bobbing, spinning, rippling and flailing their corybantic tendrils, filling the sky with music, the People forgot caution. Love began. It was not purposeless, though without water to fall into, the pollinated seeds would not germinate. It united everyone. Life-dust drifted like smoke in the radiance of Ruii; the sight, smell, taste made feverish that joy which the starwing feast awakened. Again and again A'i'ach ejaculated. He went past his skin, he became a cell of a single divine being which was itself a tornado of love. Sometimes when he felt age upon him, he would drift westward across the sea, into the cold Beyond. There, yielding up the last warmth of his body, his spirit would take its reward, the Promise that forever and ever it would be what it was now in this brief night. . . .

A howl smote. Shapes bounded from under trees, out into the open. A'i'ach saw a shaft pierce the globe next to his. Blood spurted, gas hissed forth, the shriveling form fell as a dead leaf falls. Tendrils still writhed when a Beast snatched it the last way down and fangs rent it asunder.

In the crowd and chaos, he could not know how many others died. The greatest number were escaping, rising above missile reach. Those who were armed began to drop their stones and ü boughs. It was not likely that any killed a Beast.

A'i'ach had relaxed the muscles in his globe and shot instantly upward. Safe, he might have joined the rest of

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the Swarm, to wander off in search of a place to renew festival. But rage and grief seethed too high. A far-off part of him wondered at that; the People did not take hard the death of a Person. This thing he wore, that somehow whispered mysteries—

And he carried a knife!

Recklessly spending gas, he swung about, downward. Most of the Beasts had vanished back into the woods. A few remained, devouring. He cruised at a height near the limits of prudence and peered after his chance. Since he could not drop like a rock, he must feint at one individual, then quickly jet at another, stab, rise, and attack again.

A wan beam of light struck toward him. It came from the head of a Beast which emerged from shadow, halted, and glared upward.

His will blazed forth in A'i'ach. Yonder was the monster which had his kind of bond to humans. If he had already gained a knife thereby, what might that being have gotten, what might it get, to wreak worse harm? If nothing else, killing it ought to shock its companions, make them think twice about their murderousness.

A'i'ach moved to battle. About him, the starwings happily danced and mated ***

Jannika must search for an hour before she made her contact. An ouranid could not undertake to be at an exact spot at a given time. Hers had simply informed her, while she fastened the transmitter on him, that his group was currently in the neighborhood of Mount MacDonald. She flew there and cast about in ever-deepening darkness until her indicator shone green. Having established linkage, she rose to three kilometers and set the autopilot to make slow circles. From time to time, as her subject passed northeast, she moved the center of her path.

Otherwise she was engaged in trying to be her ouranid. It was impossible, of course, but from the effort she was learning what could never have come to her through spoken language. Answers to factual questions she would not have thought to ask. Folkways, beliefs, music, poetry, aerial ballet, which she could not have known for what they were, observing from outside. Lower down in her, dimmer, but more powerful—nothing she could write into a scientific report: a sense of delights, yearnings, wind, shiningness, perfumes, clouds, rain, immense distances, a sense of what it was to be a heaven-dweller. Not complete, no, a few wavery glimpses, hard to remember afterward; yet taking her out of herself into a new world agleam with wonder.

The thrill was redoubled tonight by A'i'ach's excitement. Her impressions of what he was experiencing had never been stronger or sharper. She floated on airstreams, life-scents and song possessed her, she was a drop in an ocean beneath Ruii the mighty, there was no home to hopelessly long for because everywhere was home.

The Swarm came at last upon a

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cloud of glitterbugs, and Jannika's cosmos went wild.

For a moment, half-terrified, she started to switch off her helmet. Reason checked her hand. What was happening was just an extreme of what she had partaken in before. Ouranids seldom took much nourishment at a single time; when they did, it had an intoxicating effect. She had also felt their sexuality; A'i'ach's maleness was too unearthly to disturb her, as his dromid's femaleness had disturbed Hugh when she mated and later shed her hindquarters. Tonight the ouranids held high revel.

She surrendered to it, crescendo after crescendo, oh, if she only had a man here, but no, that would be different, would blur the sacred splendor, the Promise, the Promise!

Then the Beasts arrived. Horror erupted. Somewhere a strange voice screamed for the avenging of her shattered bliss.

—As she trotted along a bare ridge, Erakoum had thought, with a leap of her pulse, that she spied afar a faint blue ray of light in the air. She could not be certain, through the brilliance cast by Mardudek, but she altered her course in hopes. When she had scrambled a long while among stones and thorns, the glimmer disappeared. It must have been a trick of the night, perhaps moonglow on rising mists. That conclusion did nothing to ease her temper. Everything about the Flyers was unlucky!

Because of this, she was behind the rest of the pack. Her first news of quarry came through their yells. *"Hai-ay, hai-ay, hai-ay!"* echoed around, and she snarled in bafflement. Surely she would arrive too late for a kill. Nonetheless she bounded in that direction. If the Flyers did not get a good wind, she could overtake them and follow along from cover to cover, unseen. Maybe they would not go further than she had strength for, before they chanced on a fresh upswelling of firemites and descended anew. Breath rasped in her gullet, the hillside struck at her feet with unseen rocks, but eagerness flung her on till she reached the place.

It was a glade, brightly lit though crisscrossed by shadows, cut in half by a small ravine. The firemites swirled about against the forest murk, like a glinting dustcloud. Several females crouched on the turf and ripped at the remnants of their prey. The rest had departed, to trail the escaped Flyers as Erakoum planned.

She stopped at the edge of trees to pant, looked up, and froze. The mass of Flyers was slowly and chaotically streaming west, but a few lingered to cast down their pitiful weapons. From the top of one, dim light beamed aloft. She had found what she sought.

"Ee-hah!" she screamed, sprang forward, shook her javelin. "Come, evilworker, come and be slain! By your blood shall you give to my next brood the life you reaved from my first!"

There was no surprise, there was fate, when the eerie shape spiraled about and drew nearer. More would

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be settled this night than which of them was to survive. She, Erakoum, had been seized by a Power, had become an instrument of the Prophet.

Crouched, she cast her spear. The effort surged through her muscles. She saw it fly straight as the damnation it carried—but her foe swerved, it missed him by a fingerbreadth, and then all at once he was coming directly at her.

They never did that! What sheened in his seaweed grip?

Erakoum grabbed after a new javelin off her back. Each knot in the lashing was supposed to give way at a jerk, but this jammed, she must tug again, and meanwhile the enemy loomed ever more big. She recognized what he held, a human-made knife, sharp as a fresh obsidian blade and more thin and strong. She retreated. Her spear was now loose. No room for a throw. She thrust.

With crazy glee, she saw the head strike. The Flyer rolled aside before it could pierce, but blood and gas together foamed darkly from a slash across his paleness.

He spurted forward, was inside her guard. The knife smote and smote. Erakoum felt the stabs, but not yet the pain. She dropped her shaft, batted her arms, snapped jaws together. Teeth closed in flesh. Through her mouth and down her throat poured a rush of strength.

Abruptly the ground was no more beneath her hind feet. She fell over, clawed with forefeet and hands for a hold, lost it, and toppled. When she hit the side of the ravine, she rolled down across cruel snags. She had an instant's glimpse of sky above, stars and firemites, the Mardudek-lighted Flyer drifting by and bleeding. Then nothingness snatched her to itself.—

Folk at Port Kato asked what brought Jannika Rezek and Hugh Brocket home so early, so shaken. They evaded questions and hastened to their place. The door slammed behind them. A minute later, they blanked their windows.

For a time they stared at each other. The familiar room held no comfort. Illumination meant for human eyes was brass-harsh, air shut away from the forest was lifeless, faint noises from the settlement outside thickened the silence within.

He shook his head finally, blindly, and turned from her. "Erakoum gone," he mumbled. "How'm I ever going to understand that?"

"Are you sure?" she whispered.

"I . . . I felt her mind shut off . . . damn near like a blow to my own skull . . . but you were making such a fuss about your precious ouranid—"

"A'i'ach's *hurt*! His people know nothing of medicine. If you hadn't been raving till I decided I must talk you back with me before you crashed your flitter—"

Jannika broke off, swallowed hard, unclenched her fists, and became able to say: "Well, the harm is done and here we are. Shall we try to reason about it, try to find out what went

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wrong and how to stop another such horror, or not?"

"Yeah, of course." He went to the pantry. "You want a drink?" he called.

She hesitated. "Wine."

He fetched her a glassful. His right hand clutched a tumbler of straight whiskey, which he began on at once. "I felt Erakoum die," he said.

Jannika took a chair. "Yes, and I felt A'i'ach take wounds that may well prove mortal. Sit down, will you?"

He did, heavily, opposite her. She sipped from her glass, he gulped from his. Newcomers to Medea always said wine and distilled spirits there tasted more peculiar than the food. A poet had made that fact the takeoff point for a chilling verse about isolation. When it was sent to Earth as part of the news, the reply came after a century that nobody could imagine what the colonists saw in it.

Hugh hunched his shoulders. "Okay," he growled. "We should compare notes before we start forgetting, and maybe repeat tomorrow when we've had a chance to think." He reached across to their recorder and flicked it on. As he entered an identification phrase, his tone stayed dull.

"That is best for us too," Jannika reminded him. "Work, logical thought, those hold off the nightmares."

"Which this absolutely was—All right!" He regained a little vigor. "Let's try to reconstruct what did happen.

"The ouranids were out after glitterbugs and the dromids were out after ouranids. You and I witnessed an encounter. Naturally, we'd hoped we wouldn't—I suppose you prayed for that, hm?—but we knew there'd be hostilities in a lot of places. What shocked the wits out of us was when our personal natives got into a fight, with us in rapport."

Jannika bit her lip. "Worse that that," she said. "They were seeking it, those two. It was not a random encounter, it was a duel." She raised her eyes. "You never told Erakoum, any dromid, that we were linking with an ouranid too, did you?"

"No, certainly not. Nor did you tell your ouranid about my liaison. We both know better than to throw that kind of variable into a program like this."

"And the rest of the station personnel have vocabularies too limited, in either language. Very well. But I can tell you that A'i'ach knew. I was not aware he did until the fight began. Then it reached the forefront of his mind, it shouted at me, not in words but not to be mistaken about."

"Yeah, same thing for me with Erakoum, more or less."

"Let's admit what we don't want to, my dear. We have not simply been receiving from our natives. We have been transmitting. Feedback."

He lifted a helpless fist. "What the devil might convey a return message?"

"If nothing else, the radio beam that locks us onto our subjects. In-

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duced modulation. We know from the example of the glitterbug larvae—and no doubt other cases you and I never heard of—how shall we know everything about a whole world? We know Medean organisms can be extremely radio-sensitive."

"M-m, yeah, the terrific speed of Medean animals, key molecules more labile than the corresponding compounds in us. . . . Hey, wait! Neither Erakoum nor A'i'ach had more than a smattering of English. Certainly no Czech, which you've told me you usually think in. Besides, look what an effort we had to make before we could tune them in at all, in spite of everything learned on the mainland. They'd no reason to do the same, no idea of scientific method. They surely assumed it was only a whim or a piece of magic or something that made us want them to carry those objects around."

Jannika shrugged. "Perhaps when we are in rapport, we think more in their languages than we ourselves realize. And both kinds of Medeans think faster than humans, observe, learn. Anyway, I do not say their contact with us was as good as our contact with them. If nothing else, radio has much less bandwidth. I think probably what they picked up from us was subliminal."

"I guess you're right," Hugh sighed. "We'll have to sic the electronicians and neurologists into the problem, but I sure can't think of any better explanation than yours."

He leaned forward. The energy which now vibrated in his voice turned cold: "But let's try to see this thing in context, so we can maybe get a hint of what kind of information the natives have been receiving from us. Let's lay out once more why the Hansonian dromids and ouranids are at war. Basically, the dromids are dying off, and blame the ouranids. Could we, Port Kato, be at fault?"

"Why, hardly," Jannika said in astonishment. "You know what precautions we take."

Hugh smiled without mirth. "I'm thinking of psychological pollution."

"What? Impossible! Nowhere else on Medea—"

"Be quiet, will you?" he shouted. "I'm trying to bring back to my mind what I got from my friend that your friend killed."

She half-rose, white-faced, sat down again, and waited. The wine glass trembled in her fingers.

"You've always babbled about how kind and gentle and esthetic the ouranids are," he said, at her rather than to her. "You swoon over this beautiful new local faith they've acquired—the windborne flight to Farside, the death in dignity, the Nirvana, I forget what else. To hell with the grubby dromids. Dromids don't do anything but make tools and fires, hunt, care for their young, live in communities, create art and philosophy, same as humans. What's interesting to you in that?

"Well, let me tell you what I've told you before, dromids are believers too. If we could compare, I'd give long odds their faiths are stronger and more meaningful than the ouranids'.

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They keep trying to make sense of the world. Can't you sympathize the least bit?

"Okay, they have a tremendous respect for the fitness of things. When something goes seriously wrong—when a great crime or sin or shame happens—the whole world hurts. If the wrong isn't set right, everything will go bad. That's what they believe on Hansonia, and I don't know but what they've got hold of a truth.

"The lordly ouranids never paid much attention to the groundling dromids, but that was not symmetrical. The ouranids are as conspicuous as Argo, Colchis, any part of nature. In dromid eyes, they too have their ordained place and cycle.

"All at once the ouranids change. They don't give themselves back to the soil when they die, the way life is supposed to—no, they head west, over the ocean, toward that unknown place where the suns go down every evening. Can't you see how unnatural that might seem? As if a tree should walk or a corpse rise. And not an isolated incident; no, year after year after year.

"Psychosomatic abortion? How can I tell? What I can tell is that the dromids are shocked to the guts by this thing the ouranids are doing. No matter how ridiculous the thing is, it hurts them!"

She sprang to her feet. Her glass hit the floor. "Ridiculous?" she yelled. "That *Tao*, that vision? No, ridiculous, that's what your . . . your fuxes believe—except that it makes them attack innocent beings and, and eat them—I can't wait till those creatures are extinct!"

He had risen likewise. "You don't care about children dying, no, of course not," he answered. "What sense of motherhood have you got, for hell's sake? About like a balloon's. Drift free, scatter seed, forget it, it'll bud and break loose and the Swarm will adopt it, never mind anything except your pleasure."

"Why, you— Are you wishing you could be a mother?" she jeered.

His empty hand swung at her. She barely evaded the blow. Appalled, they stiffened where they stood.

He tried to speak, failed, and drank. After a full minute she said, quite low: "Hugh, our natives were getting messages from us. Not verbal. Unconscious. Through them—" she choked—"were you and I seeking to kill each other?"

He gaped until, in a single clumsy gesture, he set his own glass down and held out his arms to her. "Oh, no, oh, no," he stammered. She came to him.

Presently they went to bed. And then he could do nothing. The medicine cabinet held a remedy for that, but what followed might have happened between a couple of machines. At last she lay quietly crying and he went out to drink some more.

The wind awakened her. She lay for a time listening to it boom around the walls. Sleep drained out of her. She opened her eyes and looked at the clock. Its luminous dial said three

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hours had passed. She might as well get up. Maybe she could make Hugh feel better.

The main room was still lighted. He was asleep himself, sprawled in an armchair, a bottle beside it. How deep the lines were in his face.

How loud the wind was. Probably a storm front which the weather service had reported at sea had taken a quick, unexpected swing this way. Medean meteorology was not yet an exact science. Poor ouranids, their festival disrupted, they themselves blown about and scattered, even endangered. Normally they could ride out a gale, but a few might be carried to disaster, hit by lightning or dashed against a cliff or hopelessly entangled in a tree. The sick and injured would suffer most.

A'i'ach.

Jannika squeezed her lids together and struggled to recall how badly wounded he was. But everything had been too confused and terrible; Hugh had diverted her attention; before long she had flitted out of transmission range. Besides, A'i'ach himself could hardly have ascertained his own condition at once. It might not be grave. Or it might. He could be dead by now, or dying, or doomed to die if he didn't get help.

She was responsible—perhaps not guilty, by a moralistic definition, but responsible.

Resolution crystallized. If the weather didn't preclude, she would go search for him.

Alone? Yes. Hugh would protect, delay her, perhaps actually restrain her by force. She recorded a few words to him, wondered if they were overly impersonal, decided against composing something more affectionate. Yes, she wanted a reconciliation, and supposed he did, but she would not truckle. She redonned her field garb, added a jacket into whose pockets she stuffed some food bars, and departed.

The wind rushed bleak around her, *whoo-oo-oo*, a torrent she must breast. Clouds scudded low and thick, tinged red where Argo shone between them. The giant planet seemed to fly among ragged veils. Dust whirled in the compound, gritty on her skin. Nobody else was outdoors.

At the hangar, she punched for the latest forecast. It looked bad but not, she thought, frightening. (And if she did crash, was that such an enormous loss, to herself or anyone else?) "I am going back to my study area," she told the mechanic. When he attempted to dissuade her, she pulled rank. She never liked that, but from the Danubian ghosts she had learned how. "No further discussion. Stand by to open the way and give me assistance if required. That is an order."

The little craft shivered and drummed on the ground. Takeoff took skill—with a foul moment when a gust nearly upset her—but once aloft her vehicle flew sturdily. Risen above the cloud deck, she saw it heave like a sea, Argo a mountain rearing out of it, stars and companion moons flickery overhead. Northward bulked a darkness more deep and high, the front.

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The weather would really stiffen in the next few hours. If she wasn't back soon, she'd better stay put till it cleared.

The flight was quick to the battleground. When the inertial pilot had brought her there, she circled, put on her helmet, activated the system. Her pulse fluttered and her mouth had dried. "A'i'ach," she breathed, "be alive, please be alive."

The green light went on. At least his transmitter existed on the site. He? She must will herself toward rapport.

Weakness, pain, a racket of soughing leaves, tossing boughs—"A'i'ach, hang on, I'm coming down!"

A leap of gladness. Yes, he did perceive her.

Landing would be risky indeed. The aircraft had a vertical capability, excellent radar and sonar, a computer and effectors to handle most of the work. However, the clear space below was not large, it was cleft in twain, and while the surrounding forest was a fair windbreak, there would be vile drafts and eddies. "God, into Your hands I give myself," she said, and wondered as often before how Hugh endured his atheism.

Nevertheless, if she waited she would lose courage. Down!

Her descent was wilder still than she had expected. First the clouds were a maelstrom, then she was through them but into a raving blast, then she saw treetops grab at her. The vehicle rolled, pitched, yawed. Had she been an utter fool? She didn't truly want to leave this life. . . .

She made it, and for minutes sat strengthless. When she stirred, she felt her entire body ache from tension. But A'i'ach's hurt was in her. Called by that need, she unharnessed and went forth.

The noise was immense in the black palisade of trees around her, their branches groaned, their crowns foamed; but down on the ground the air, though restless, was quieter, nearly warm. Unseen Argo reddened the clouds, which cast enough glow that she didn't need her flashlight. She found no trace of the slain ouranids. Well, they had no bones; the dromids must have eaten every scrap. What a ghastly supersition— Where was A'i'ach?

She found him after a search. He lay behind a spiny bush, in which he had woven his tendrils to secure himself. His body was deflated to the minimum, an empty sack; but his eyes gleamed, and he could speak, in the shrill, puffing language of his people, which she had come to know was melodious.

"May joy blow upon you. I never hoped for your advent. Welcome you are. Here it has been lonely." A shudder was in that last word. Ouranids could not long stand being parted from their Swarm. Some xenologists believed that with them consciousness was more collective than individual. Jannika rejected that idea, unless perhaps it applied to the different species found in parts of Nearside. A'i'ach had a soul of his own!

She knelt. "How are you?" She

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could not render his sounds any better than he could hers, but he had learned to interpret.

"It is not overly ill with me, now that you are nigh. I lost blood and gas, but those wounds have closed. Weak, I settled in a tree until the Beasts left. Meanwhile the wind rose. I thought best not to ride it in my state. Yet I could not stay in the tree, I would have been blown away. So I valved out the rest of my gas and crept to this shelter."

The speech held far more than such a bare statement. The denotation was laconic and stoical, the connotations not. A'i'ach would need at least a day to regenerate sufficient hydrogen for ascent—how long depended on how much food he could reach in his crippled condition—unless a carnivore found him first, which was quite likely. Jannika imagined what a flood of suffering, dread, and bravery would have come over her had she been wearing her helmet.

She gathered the flaccid form into her arms. It weighed little. It felt

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warm and silky. He cooperated as well as he was able. Just the same, part of him dragged on the ground, which must have been painful.

She must be rougher still, hauling on folds of skin, when she brought him inside the aircraft. It had scant room to spare; he was practically bundled into the rear section. Rather than apologizing when he moaned, or saying anything in particular, she sang to him. He didn't know the ancient Terrestrial words, but he liked the tunes and realized what she meant by them.

She had equipped her vehicle for basic medical help to natives, and had given it on past occasions. A'i'ach's injuries were not deep, because most of him was scarcely more than a bag; however, the bag had been torn in several places and, though it was self-sealing, flight would reopen it unless it got reinforcement. Applying local anesthetics and antibiotics—that much had been learned about Medean biochemistry—she stitched the gashes.

"There, you can rest," she said when, cramped, sweat-soaked, and shaky, she was done. "Later I will give you an injection of gas and you can rise immediately if you choose. I think, though, we would both be wisest to wait out the gale."

A human would have groaned: "It is *tight* in here."

"Yes, I know what you mean, but— A'i'ach, let me put my helmet on." She pointed. "That will join our spirits as they were joined before. It may take your mind off your discomfort. And at this short range, given our new knowledge—" A thrill went through her. "What may we not find out?"

"Good," he agreed. "We may enjoy unique experiences." The concept of discovery for its own sake was foreign to him . . . but his search for pleasures went far beyond hedonism.

Eager despite her weariness, she moved into her seat and reached for the apparatus. The radio receiver, always open to the standard carrier band, chose that moment to buzz.

Argo in the east glowered at the nearing, lightning-shot wall of storm in the north. Below, the clouds already present roiled in reds and darknesses. Wind wailed. Hugh's aircraft lurched and bucked. Despite a heater, chill seeped through the canopy, as if brought by the light of stars and moons.

"Jan, are you there?" he called. "Are you all right?"

Her voice was a swordstroke of deliverance. "Hugh? Is that you, darling?"

"Yes, sure, who the hell else did you expect? I woke up, played your message, and— Are you all right?"

"Quite safe. But I don't dare take off in this weather. And you mustn't try to land, that would be too dangerous by now. You shouldn't stay, either. Darling, *rostomily,* that you came!"

"Judas priest, sweetheart, how could I not? Tell me what's happened."

She explained. At the end, he nod-

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ded a head which still ached a bit from liquor in spite of a nedolor tablet. "Fine," he said. "You wait for calm air, pump up your friend, and come on home." An idea he had been nursing nudged him. "Uh, I wonder. Do you think he could go down into that gulch and recover Erakoum's unit? Those things are scarce, you know." He paused. "I suppose it'd be too much to ask him to throw a little soil over her."

Jannika's tone held pity. "I can do that."

"No, you can't. I got a clear impression from Erakoum as she was falling, before she cracked her skull apart or whatever she did. Nobody can climb down without a rope secured on top. It'd be impossible to return. Even with a rope, it'd be crazy dangerous. Her companions didn't attempt anything, did they?"

Reluctance: "I'll ask him. It may be asking a lot. Is the unit functional?"

"Hm, yes, I'd better check on that first. I'll report in a minute or three. Love you."

He did, he knew, no matter how often she enraged him. The idea that, somewhere in the abysses of his being, he might have wished her death, was not to be borne. He'd have followed her through a heavier tempest than this, merely to deny it.

Well, he could go home with a satisfied conscience and wait for her arrival, after which—what? The uncertainty made a hollowness in him.

His instrument flashed green. Okay. Erakoum's button was transmitting, therefore unharmed and worth salvaging. If only she herself—

He tensed. The breath rattled in his lungs. Did he *know* she was dead?

He lowered the helmet over his temples. His hands shook, giving him trouble in making the connections. He pressed the switch. He willed to perceive—

Pain twisted like white-hot wires, strength ebbed and ebbed, soft waves of nothingness flowed ever more often, but still Erakoum defied. The slit of sky that she could see, from where she lay unable to creep further, was full of wind. . . . She shocked to complete awareness. Again she sensed Hugh's presence.

"Broken bones, feels like. Heavy blood loss. She'll die in a few more hours. Unless you give her first aid, Jan. Then she ought to last till we can fly her to Port Kato for complete attention."

"Oh, I can do sewing and bandaging and splinting, whatever, yes. And nedolor's an analgesic stimulant for dromids too, isn't it? And simply a drink of water could make the whole difference; she must be dehydrated. But how to reach her?"

"Your ouranid can lift her up, after you've inflated him."

"You can't be serious! A'i'ach's hurt, convalescent—and Erakoum tried to kill him!"

"That was mutual, right?"

"Well—"

"Jan, I'm not going to abandon her. She's down in a grave, who used to run

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free, and the touch of me she's getting is more to her than I could have imagined. I'll stay till she's rescued, or else I'll stay till she dies."

"No, Hugh, you mustn't. The storm."

"I'm not trying to blackmail you, dearest. In fact, I won't blame your ouranid much if he refuses. But I can't leave Erakoum. I just plain can't."

"I . . . I have learned something about you. . . . I will try."

***A'i'ach had not understood his Jannika. It was not believable that helping a Beast could help bring peace. That creature was what it was, a slaughterer. And yet, yet, once there had been no trouble with the Beasts, once they had been the animals which most interested and entertained the People. He himself remembered songs about their fleetness and their fires. In those lost days they had been called the Flame Dancers.

What made him yield to her plea was unclear in his spirit. She had probably saved his life, at hazard to her own, and this was an overpowering new thought to him. He wanted greatly to maintain his union with her, which enriched his world, and therefore hesitated to deny a request that seemed as urgent as hers. Through the union, she helmeted, he believed he felt what she did when she said, with water running from her eyes, "I want to heal what *I* have done—" and that kind of feeling was transcendent, like the Shining Time, and was what finally decided him.

She assisted him from the thing-which-bore-her and payed out a tube. Through the latter he drank gas, a wind-rush of renewed life. His injuries twinged when his globe expanded, but he could ignore that.

He needed her anchoring weight to get across the ground to the ravine. Fingers and tendrils intertwined, they nevertheless came near being carried away. Had he let himself swell to full size, he could have lifted her. Air harried and hooted, snatched at him, wanted to cast him among thorns—how horrible the ground was!

How much worse to descend below it. He throbbed to an emotion he scarcely recognized. Had she been in rapport, she could have told him that the English word for it was "terror." A human or a dromid who felt it in that degree would have recoiled from the drop. A'i'ach made it a force blowing him onward, because this too raised him out of himself.

At the edge, she threw her arms around him as far as they would go, laid her mouth to his pelt, and said, "Good luck, dear A'i'ach, dear brave A'i'ach, good luck, God keep you." Those were the noises she made in her language. He did not recognize the gesture either.

A cylinder she had given him to hold threw a strong beam of light. He saw the jagged slope tumble downward underneath him, and thought that if he was cast against that, he was done for. Then his spirit would have a fearful journey, with no body to shelter it, before it reached Beyond—if it

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did, if it was not shredded and scattered first. Quickly, before the churning airs could take full hold of him, he jetted across the brink. He contracted. He sank.

The dread as gloom and walls closed in was like no other carouse in his life. At its core, he felt incandescently aware. Yes, the human had brought him into strange skies.

Through the dankness he caught an odor more sharp. He steered that way. His flash picked out the Beast, sprawled on sharp talus, gasping and glaring. He used jets and siphon to position himself out of reach and said in what English he had, "I haff ch'um say-aff ee-you."***

From the depths of her death-place, Erakoum looked up at the Flyer. She could barely make him out, a big pale moon behind a glare of light. Amazement heaved her out of a drowse. Had her enemy pursued her down here in his ill-wishing?

Good! She would die in battle, not the torment which ripped her. "Come on and fight," she called hoarsely. If she could sink teeth in him, get a last lick of his blood— The memory of that taste was like sweet lightning. During the time afterward which refused to end, she had thought she would be dead already if she had not swallowed those drops.

Their wonder-working had faded out. She stirred, seeking a defensive posture. Agony speared through her, followed by night.

When she roused, the Flyer still waited. Amidst a roaring in her ears, she heard, over and over, "I haff ch'um say-aff ee-you."

Human language? This *was* the being that the humans favored as they did her. It had to be, though the ray from its head was hidden by the ray from its tendrils. *Could Hugh have been bound all the while to both?*

Erakoum strove to form syllables never meant for her mouth and throat. "Ha-watt-tt you ha-wannit? Gho, no bea haiar, gho."

The Flyer made a response. She could no more follow that than he appeared to have followed hers. He must have come down to make sure of her, or simply to mock her while she died. Erakoum scrabbled weakly after a spear. She couldn't throw one, but—

From the unknownness wherein dwelt the soul of Hugh, she suddenly knew: He wants to save you.

Impossible. But . . . but there the Flyer was. Half-delirious, Erakoum could yet remember that Flyers were seldom that patient.

What else could befall but death? Nothing. She lay back on the rock shards. Let the Flyer be her doom or be her Mardudek. She had found the courage to surrender.

The shape hovered. Her hair sensed tiny gusts, and she thought dimly that this must be a difficult place for him too. Speech burst and skirled. He was trying to explain something, but she was too hurt and tired to listen. She folded her hands around her muzzle. Would he appreciate that gesture?

Maybe. Hesitant, he neared. She

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kept motionless. Even when his tendrils brushed her, she kept motionless.

They slipped across her body, got a purchase, tightened. Through the haze of pain, she saw him swelling. He meant to lift her—up to Hugh?

When he did, her knife wounds opened and she shrieked before she swooned.

Her next knowledge was of lying on turf under a hasty, red-lit sky. A human crouched above her, talking to a small box that replied in the voice of Hugh. Behind, the Flyer lay shrunken, clutching a bush. Storm brawled; the first stinging raindrops fell.

In the hidden way of hunters, she knew that she was dying. The human might staunch those cuts and stabs, but could not give back what was lost.

Memory—what she had heard tell, what she had briefly tasted herself—"Blood of the Flyer. It will save me. Blood of the Flyer, if he will give." She was not sure whether she spoke or dreamed it. She sank back into the darkness.

When she surfaced anew, the Flyer was beside her, embracing her against the wind. The human was carefully using a knife on a tendril. The Flyer brought the tendril in between Erakoum's fangs. As the rain's full violence began, she drank.—

A double sunrise was always lovely.

Jannika had delayed telling Hugh her news. She wanted to surprise him, preferably after his anxiety about his dromid was past. Well, it was; Erakoum would be hospitalized several days in Port Kato, which ought to be an interesting experience for all concerned, but she would get well. A'i'ach had already rejoined his Swarm.

When Hugh wakened from the sleep of exhaustion which followed his bedside vigil, Jannika proposed a dawn picnic, and was touched at how fast he agreed. They flitted to a place they knew on the sea cliffs, spread out their food, and sat down to watch.

At first Argo, the stars, and a pair of moons were the only lights. Slowly heaven brightened, the ocean shimmered silver beneath blue, Phrixus and Helle wheeled by the great planet. Wild songs went trilling through air drenched with an odor of roanflower, which is like violets.

"I got the word from the Center," she declared while she held his hand. "It's definite. The chemistry was soon unraveled, given the extra clue we had from the reviving effect of blood."

He turned about. "What?"

"Manganese deficiency," she said. "A trace element in Medean biology, but vital, especially to dromids and their reproduction—and evidently to something else in ouranids, since they concentrate it to a high degree. Hansonia turns out to be poorly supplied with it. Ouranids, going west to die, were removing a significant percentage from the ecology. The answer is simple. We need not try to change the ouranid belief. Temporarily, we can have a manganese supplement made

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up and offer it to the dromids. In the long run, we can mine the ore where it's plentiful and scatter it as a dust across the island. Your friends will live, Hugh."

He was quiet for a time. Then—he could surprise her, this son of an outback miner—he said: "That's terrific. The engineering solution. But the bitterness won't go away overnight. We won't see any quick happy ending. Maybe not you and me, either." He seized her to him. "Damnation, though, let's try!" ■

BIOLOG

Poul Anderson

Seemingly learned in nearly every phase of human culture, Poul Anderson is especially knowledgeable in the heroic age of his Scandinavian ancestors. The Viking era is often in the background of an Anderson adventure story set in the far future. The resulting sympathetic vibrations have made him immensely popular among modern Scandinavian readers.

His five Hugo awards at world science fiction conventions and two Nebulas from the Science Fiction Writers of America show Poul is scarcely less appreciated by American readers and his professional peers. He has been a prolific, full-time writer since graduation from the University of Minnesota with a degree in physics.

The first published Anderson story was a collaboration appearing in the March 1947 Analog (then Astounding*). Since that date, more than 50 books and 200 shorter items have come from the Anderson typewriter. Most of this has been science fiction, but he has also published fantasy, historical novels, mysteries, and just about everything else including poetry and nonfiction.*

Poul grew up mostly in Texas and on a farm in Minnesota, moving in 1953 to the San Francisco Bay area. He is much in evidence at science fiction conventions, where he is noted for the singing of long, heroic sagas, often of his own composition. The 1959 world science fiction convention in Detroit saw Poul guest of honor, and he has been selected by many smaller conventions as well over the years. Numerous colleges and high schools have invited him to lecture, too, where he captivates audiences with an infusion of adventure into erudition.

He is a gourmet, wine connoisseur, world traveler, hiker, sailer, carpenter, gardener, and a member of the Baker Street Irregulars and the Society of Creative Anachronism. His professional activities led him to assume a term as president of the Science Fiction Writers of America and act as regional vice president of the Mystery Writers of America.

Best of all, Poul has a new novel coming out from Putnam/Berkley just about now, called The Avatar. *And, of course, a continuing series of stories for forthcoming Analogs.*

by Jay Kay Klein

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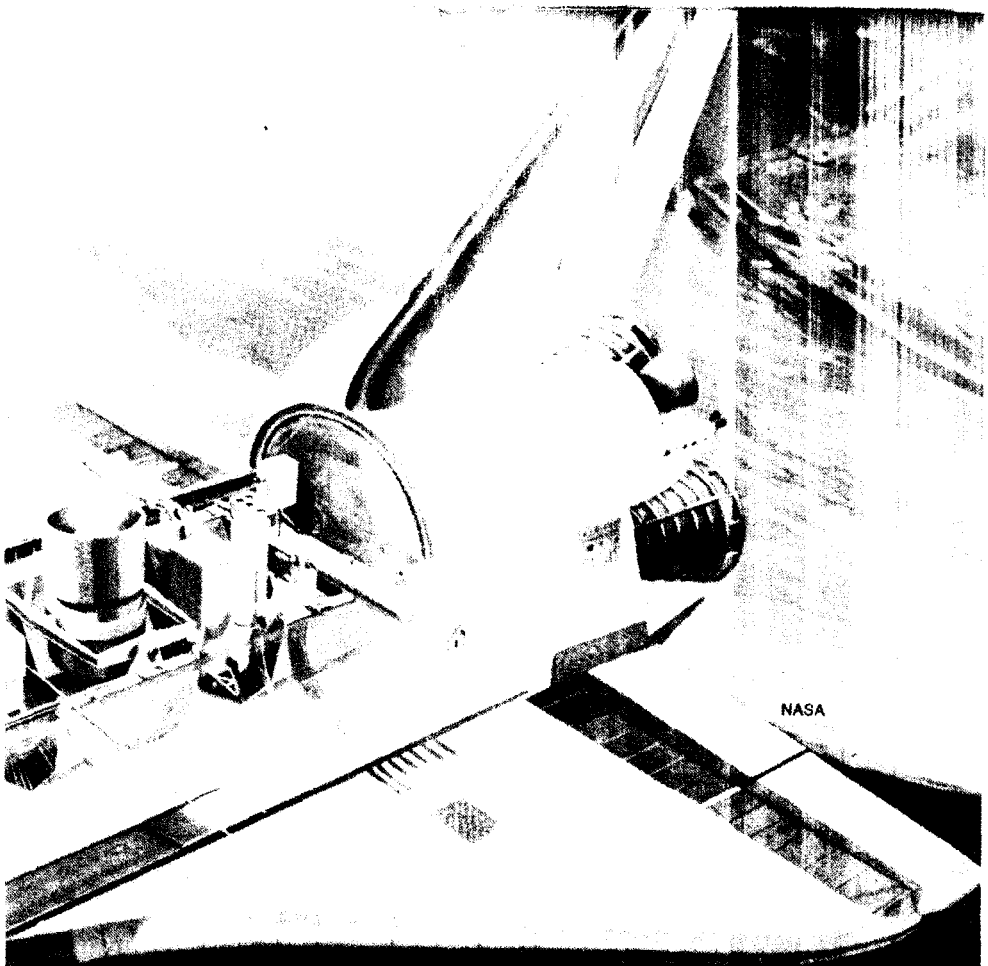

No one will know for sure until March, 1979, but it seems likely that the Space Shuttle is going to give its passengers a ride that combines all the best features of a rollercoaster, the Indianapolis 500, and a kamikaze mission. (Regular Analog readers will remember Al Ragsdale's detailed description of this in "Flying the Space Shuttle Orbiter," December 1977.) Michael Collins, who piloted the lunar orbiter during the first Moon landing, admits that the shuttle configuration "makes an old pilot like me nervous."

For one thing, the shuttle is the first large spacecraft we've launched that has wings. As it gains speed after takeoff, the wings will produce lift, which has to be compensated for by the swivel-mounted steering rockets of

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the shuttle main engines. If anything goes wrong while the solid-fuel boosters are blasting, the crew just has to clench their teeth and ride it out; there's no way to turn them off. The real aerodynamic complications, though, start when the craft exceeds the speed of sound, when the four shock waves from the orbiter, external fuel tank, and boosters begin to interact. Computer models suggest that the induced shake-rattle-and-roll will be within tolerable limits, but we won't know for sure until it actually flies.

For safety's sake, the first four flights will be conducted with a crew of two, sitting in ejection seats. If there are no problems, the ejection seats come out and the passengers go in.

It's worth pointing out that the design of the shuttle owes at least as much to politics and economics as it does to aeronautical and astronautical engineering. The design NASA favored, called the "F-1 Flyback," was for a two-stage system. The first stage would have been powered by five Rocketdyne F-1 engines (as is the first stage of a Saturn V), and be piloted; it would sling the orbiter into space and then come back to base for refueling and quick reuse. Unfortunately, the budget for it called for peak funding of $1.2 billion, and the Nixon administration was adamant at holding it to $1 billion.

(The space community has good reason to feel bitter about the Nixon years. That he solemnly took credit for the Apollo project might have been only amusing, if the rhetoric had been followed up by support for future space activity. Instead, while Spiro Agnew was down at the Cape [for Apollo-Soyuz] making noises about a manned flight to Mars, Nixon was telling the Office of Management and Budget to slash NASA's funds.)

The decision to use solid-fuel boosters, rather than liquid-fuel (which could be shut off if trouble developed), was also a result of economizing. The booster might sink before the ship got there to retrieve it, and the complex machinery associated with even a simple liquid booster would cost some forty times the price tag on the plain metal shell of a solid-fuel one.

For all these compromises, the shuttle is a marvel, our first true spaceship. It brings the cost of space flight within reach of small companies, schools, and even individuals.

Half the orbiter's length is taken over by the cargo bay, which, once in orbit, is pumped free of air and opened up, exposing its payload to the space environment. Larger than a boxcar, the cargo bay can contain dozens of individual experiments, a completely equipped space laboratory, or even a small spacecraft.

If you have $20,000,000 you can buy the whole thing: sixty feet of empty space for a week. But if your experiment weighs less than 200 pounds and takes up less than five cubic feet, NASA will sell you a slot for as little as $3,000—what they call

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a "Getaway Special." Aerospace firms from all over the world have reserved Getaway slots, as have several universities and even a Rotary Club (Houston's, for area science students).

If you have a sneaky, capitalistic turn of mind, it might occur to you that five cubic feet of, say, tie tacks might be worth considerably more that $3,000, for the souvenir value of having been in space. Disabuse yourself of the scheme: NASA requires that you submit a detailed report a year before launch; if your project doesn't have legitimate research value, it won't fly.

While sympathizing with NASA's desire not to trivialize the shuttle—and not waste space, in more ways than one—you have to wonder whether it might not be better if the agency simply bowed to the inevitable, and allowed commercial exploitation in return for a healthy chunk of the profits. That's science fiction, though.

Seriously, NASA is in an odd, perhaps uncomfortable position, because they hope to make the shuttle pay for itself on most of the 560 missions scheduled between 1980 and 1992. NASA was allowed to go ahead with the space shuttle only under the condition that it charge enough in users' fees to recoup the program's operating costs. Thus an arm of the government that was set up to be a strictly nonprofit-making research and development concern has taken on some of the functions of "a trucking company," in the words of one high official. He also noted that after 1983, "We may wind up with a regulated company such as Comsat running it, or even another government agency, such as the Transportation Department," with NASA going back into the business, or nonbusiness, of space exploration.

The first six shuttle flights will be called "orbital flight tests," primarily designed to check out the shuttle's performance and monitor the effects it has on the space around it. There will also be payloads, though, from the second trip on. The seventh flight, the first operational mission, will leave in orbit the Long Duration Exposure Facility, a large rack of Getaway Special-type experiments which will stay in orbit for a year, and then be returned to Earth for analysis.

In any previous space mission, American or Soviet, doing these jobs would require EVA, extravehicular activity. The cargo bay of the shuttle, though, is equipped with a "remote manipulator"—a mechanical arm powerful enough to push large spacecraft and satellites around—that scientists can control from the shirtsleeve comfort of the flight deck.

This is not to say that there will be no EVA associated with shuttle missions. In fact, when EVA is necessary, NASA claims that crewmembers will be better prepared for it than any previous astronauts have been. They won't have to contend with clumsy umbilical links to the spacecraft's life support system; instead, each can be equipped with a self-contained Extravehicular Mobility Unit, which looks remarkably like the spacesuits that

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graced the garish covers of pulp magazines a half-century ago. They won't have to stay tethered to the orbiter, either. A Manned Maneuvering Unit, powered by nitrogen jets, will allow them to move around in the cargo bay unimpeded, and even fly some distance away from the ship.

It's hard to predict what the economic and social effect of the shuttle is going to be, since it is a fundamentally unique phenomenon, whether you compare it to existing transportation systems, or think of it in terms of the earlier space program. By way of analogy, consider what the response might be if you described the automobile to a nineteenth century "futurist," and told him that it would replace the horse as a mode of personal transportation. He might predict that it would solve the cities' pollution problems (though putting street sweepers out of work) and make streets safer for pedestrians. He wouldn't predict that it would profoundly affect the country's sexual mores, or guess that it might annually kill twenty times as many as died in the War of 1812. Not to mention oil slicks, Arabs, filling stations, and freeways.

The ultimate effect of the shuttle may be no less profound, no more predictable. But we can say something for certain about the ways it will be used in the next decade.

Obviously, the shuttle can put hardware into orbit, like any launch system. But it can also be used to *avoid* putting redundant things in orbit.

Say a communications corporation relies on a satellite relay for transatlantic telephone calls. Suppose further that one lousy diode in that satellite burns out. Not only do they have to build a whole new multimillion-dollar satellite, but before they even pick up a soldering iron they have to commit $30 million or more to NASA, for a launch vehicle. With the shuttle, they can simply hand a fifty-cent diode to one of the crew, and have him (or her) install it the next time they're in the neighborhood. If they don't know why the satellite's malfunctioning, the shuttle can pluck it out of orbit and bring it down for their technicians to tinker with. Either way, they save a fortune.

To facilitate repairs in orbit, NASA is experimenting with modular design in satellites. This would allow mass production of certain parts, and make it possible to fix a satellite with one trip, even if you're not quite sure what's wrong with it. Some modules could be elements designed to be periodically replaced, like film packs or micrometeorite dust-catchers.

Modular design will be incorporated in Spacelab, the most ambitious project currently scheduled for the shuttle. This is a small manned laboratory designed to fit inside the shuttle's cargo bay. It's being built by ESRO, the European Space Research Organization. Ten European nations have committed nearly $400 million to build the first one by 1980. The United States will buy several others from ESRO, each one designed for ten years of service (about 50 flights

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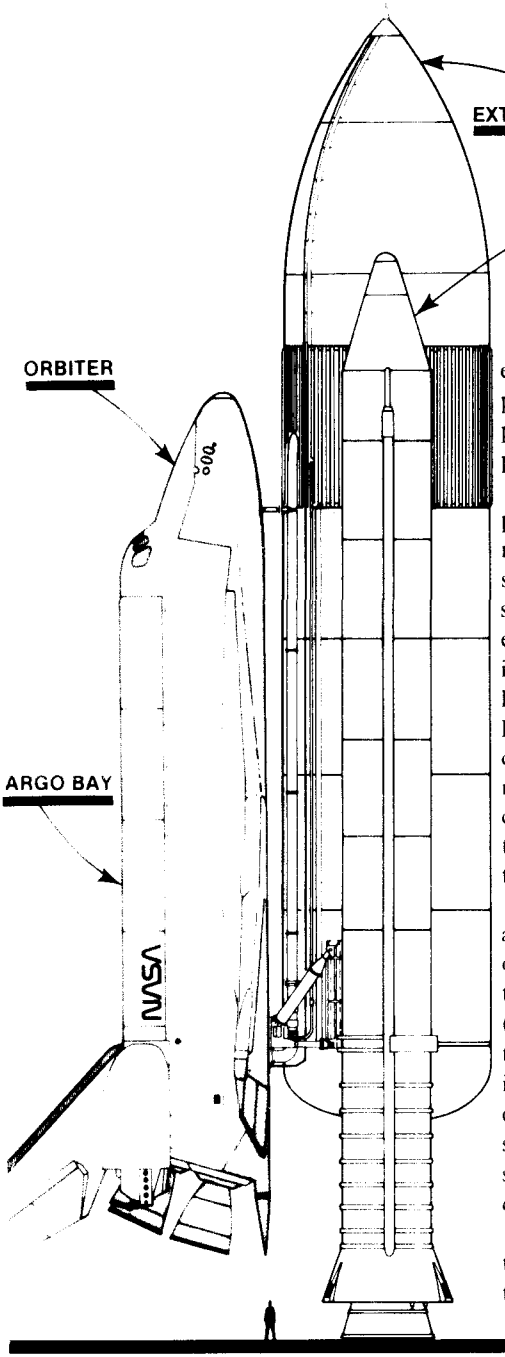

each), to serve as interim research platforms until the late 80's, when a permanent space station will be completed.

Spacelab would normally be composed of a pressurized cylindrical module in which the shuttle's life support systems will maintain a shirt-sleeve environment, overseeing an equipment pallet loaded with various instruments. A tunnel connects the laboratory module with the shuttle's living area. Another equipment pallet can be substituted for the laboratory module, in which case experiments could be conducted either from inside the shuttle or from Earth, by telemetry.

The logical extension of Spacelab is a permanently orbiting, permanently occupied laboratory. NASA has tentative plans for three such structures (housing four, eight, and twelve scientists), to be built from the mid-eighties to the early nineties. These can evolve naturally from the Spacelab, simply by building on the existing structure a life-support module to take over the orbiter's function.

It may be possible to use the shuttle's external fuel tank—that part that's normally wasted—as the basic

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raw material for these laboratories. If this can be done, a current NASA study indicates that they could be orbited sooner and more cheaply than if new hardware had to be developed.

It's a first step toward the habitation of space, since these orbiting laboratories won't be operated by astronauts but by ordinary scientists, staying aloft for weeks or months at a time. It will be no picnic for them, though, cooped up with a dozen coworkers in a cluster of overgrown tin cans drifting in free fall. They will be pioneers in the usual American sense of the word, roughing it. The ones who succeed them will have an easier time of it. ■

This article is adapted from a chapter of *The Endless Horizon*, by Joe Haldeman and Rick Sternbach, to be published by St. Martin's Press in 1979.

If the development of the space shuttle goes according to plan, the first routine operational flight (after six test flights in 1979-1980) will be for the launching of the Long Duration Exposure Facility. The LDEF is a roughly cylindrical frame that can expose as many as seventy-two independent experiments to the outer space environment, racked in trays around the outside of the cylinder.

The following table describes the experiments that have been approved by NASA for the LDEF. Although many of them are NASA projects, many private companies and universities are also represented. Sixteen of the experiments are sponsored by foreign countries.

EXPERIMENT TITLE	SPONSOR	COMMENTS
Study of Impact Craters on Various materials	ONERA/DERTS (France)	Thick targets made of various metals, glasses, and minerals will be exposed to micrometeorite bombardment. Analysis of microcraters formed will give information about mass distribution, etc.
Space Debris Experiment	NASA (Langley)	Exposing various configurations of targets to help predict type and degree of damage future spacecraft may expect from meteoroids.
Multiple Foil Microabrasion Package	University of Kent (England)	Expecting unprecedented level of accuracy in measuring characteristics of near-Earth solid particle environment.
The Chemistry of Micrometeoroids	NASA (Houston)	Testing the hypothesis that most micrometeoroids are derived from comets.

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	Attempt at a Dust Debris Collection With Stacked Detector	ONERA/DERTS (France)	Using a stack of thin film detectors to sort out micrometeoroids according to impact velocity, and retain them for later chemical analysis (a test of the technique).
POWER	Advanced Photovoltaic Experiment	NASA (Lewis)	Effect of space environment on new solar cell and array materials.
	Solar Array Materials and Assembly Techniques Evaluation	JPL	For applications in large power satellites and solar-powered spacecraft.
	Space Power Experiment	NASA (Lewis)	Low-cost approach to space power systems, using off-the-shelf hardware.
	Advanced Solar Array Technology	NASA (Goddard)	Toward increasing the efficiency and cost-effectiveness of solar arrays.
	Space Evaluation of Advanced Solar Arrays	NASA (Marshall)	Effects of radiation and vacuum on materials proposed for use in lightweight solar arrays (for space stations, spacecraft, and power satellites).
MATERIALS	Space Exposure of Materials for Advanced Spacecraft	NASA (Langley)	Effect of orbital environment on composite materials proposed for advanced craft.
	Space Testing of Holographic Data Storage Crystals	Georgia Tech	Effect of radiation and vacuum on ultra-high-capacity data storage crystals.
	Low Temperature Heat Pipe Experiment	NASA (Goddard)	Testing performance of three different materials for low-temperature heat transfer in space.
	Space Environment Effects on Spacecraft Materials	The Aerospace Corporation	Changes in properties of various materials after exposure to space environment.
	Growth of Crystals from Solutions in Low Gravity	Rockwell Int'l and Technical University of Denmark	Novel method for growth of crystals from diffusion of two or more reactant solutions, with the force of gravity reduced millionfold.
	The Collection of Atomic Oxygen with Solid Surfaces at Orbital Altitudes	University of Alabama	Effects of exposure to high fluxes of atomic oxygen on various materials (determine measurable effects).

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Synergistic Effects of Space Environment on the Properties of Metallized Dialectrics	Grumman	Degradation of mechanical, optical, and dielectric properties; coatings to retard degradation.
Effects of Space Environment on Various Composite and Laminate Materials (four titles)	University of Toronto Rockwell Int'l (2) University of Michigan	These experiments measure the effects of the space environment on the mechanical properties of complex materials that may be used in future space structures.
Investigation of Critical Surface Degradation Effects on Coatings and Solar Cells Developed in Germany	MBB Space Division (Germany)	Effects of radiation and contamination on solar cells and thermal coatings.
Thermal Control Coatings for Space Structures (six titles)	NASA (Marshall, Langley), Southern U.; CNES, ONERA/DERTS (France), TRW	Observing the effect of space environment on various coating materials; comparing results with vacuum-chamber results to determine validity of Earthbound testing.

OPTICS

Fiber Optics Experiments (two titles)	JPL, USAF Weapons Laboratory	Testing durability of fiber-optic data transmission systems for applications satellite use.
Effects of Long-Duration Exposure on Active Optical Systems	Georgia Tech	Effects of space exposure on the performance of lasers and other optical components.
Development and Test of EUV Thin Film Filters and Cathodes	CNRS/LPSP (France)	Development and testing in space environment of optical components that operate in extreme UV frequencies.
Vacuum Deposited Optical Coatings	MATRA/Optical (France)	Long-term stability of vacuum-deposited optical coatings.
Exposure to Space Radiation of High-Performance IR Multilayer Filters	U. of Reading (U.K.)	Testing optical behavior of infrared interference filters of new design, under influence of radiation.
Ruled and Holographic Gratings	JOBIN YVON (France)	Long-term stability of gratings.
Studies of Radiation Effects on Fiber Optic Waveguides	ONERA/DERTS (France)	Radiation-induced damage to waveguides will be compared to laboratory tests, to determine validity of Earthbound experiments.

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SHUTTLE RESEARCH	LDEF/Induced Environment Contamination Monitor	NASA (Marshall)	Contamination of payloads during normal operations.
	Shuttle Bay Environment Measurements	NASA (Langley, Goddard)	Physical effects of launch and reentry on a heavy payload in the shuttle bay.
RADIATION	Heavy Ions in Space	Naval Research Lab	Investigating low-energy nuclei, heavy (Van Allen Belt) nuclei, and ultra-heavy (cosmic ray) nuclei.
	Free Flyer Biostack Experiment	Universität Frankfurt	Establish radiation protection guidelines for man in space (shielding against very heavy ions).
	A High-Resolution Study of Ultra-Heavy Cosmic Ray Nuclei	ESTEC (Netherlands) and Dublin Institute for Advanced Studies (Eire)	Charge and energy spectra of cosmic ray nuclei from interstellar space.
	Passive Trapped Radiation Detection	USAF Geophysics Lab	Flux and energy spectrum of trapped radiation.
DETECTORS	Effect of Space Exposure on Pyrolytic IR Detectors	NASA (Langley)	Performance of pyrolytic infrared detectors will be measured before and after long-duration space exposure.
	Passive Exposure of Earth Radiation Budget Experiment Components	The Epply Laboratory, Inc.	Effect of long-duration space exposure on sensitive radiometric instruments.
	Interstellar Gas Experiment	NASA (Houston) and University of Bern	Measurement of structure of interstellar gas components at different points in the Earth's orbit.
	Solar Flux Calibration Components	CNRS/Service d'Aeronomie (France)	Recording calibration data for current and future spacecraft.
OTHER	Orbital Lubrication Experiment	Ball Brothers Research Corporation	Cumulative effects of vacuum and radiation on various lubricant oils.
	Development and Test of EUV Thin Film Filters and Cathodes	CNRS/LPSP (France)	Testing space behavior of extreme-ultraviolet components.
	Study of Factors Determining Radiation Sensitivity of Quartz Crystal Oscillators	Martin Marietta	Tests to improve "radiation hardness" of components used in spaceborne high-precision clocks.

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ACCORD

Happy is the man who knows his own mind—and everyone else's!

George Spiner was not too unhappy on his long solitary walk back to the Underground station in the dark. Julie was beautiful, was intelligent enough to listen to him, and showed signs she would soon be his bed-mate, possibly later his wife.

He couldn't afford a wife at present. A trainee accountant, with his big examination due in a month, he should really have been putting in more time working, but George was not really one of the world's dedicated workers, and Julie was special.

Roborough Way is long and straight—part, in fact, of an old Roman road, but to get to the station you have to turn left at Wyfold Street, along the edge of the flat devastated area laughably known as "the park." It was very dark along Wyfold Street, where the street lamps, never very good, had mostly been shot out of action by hooligan airpistols, and even

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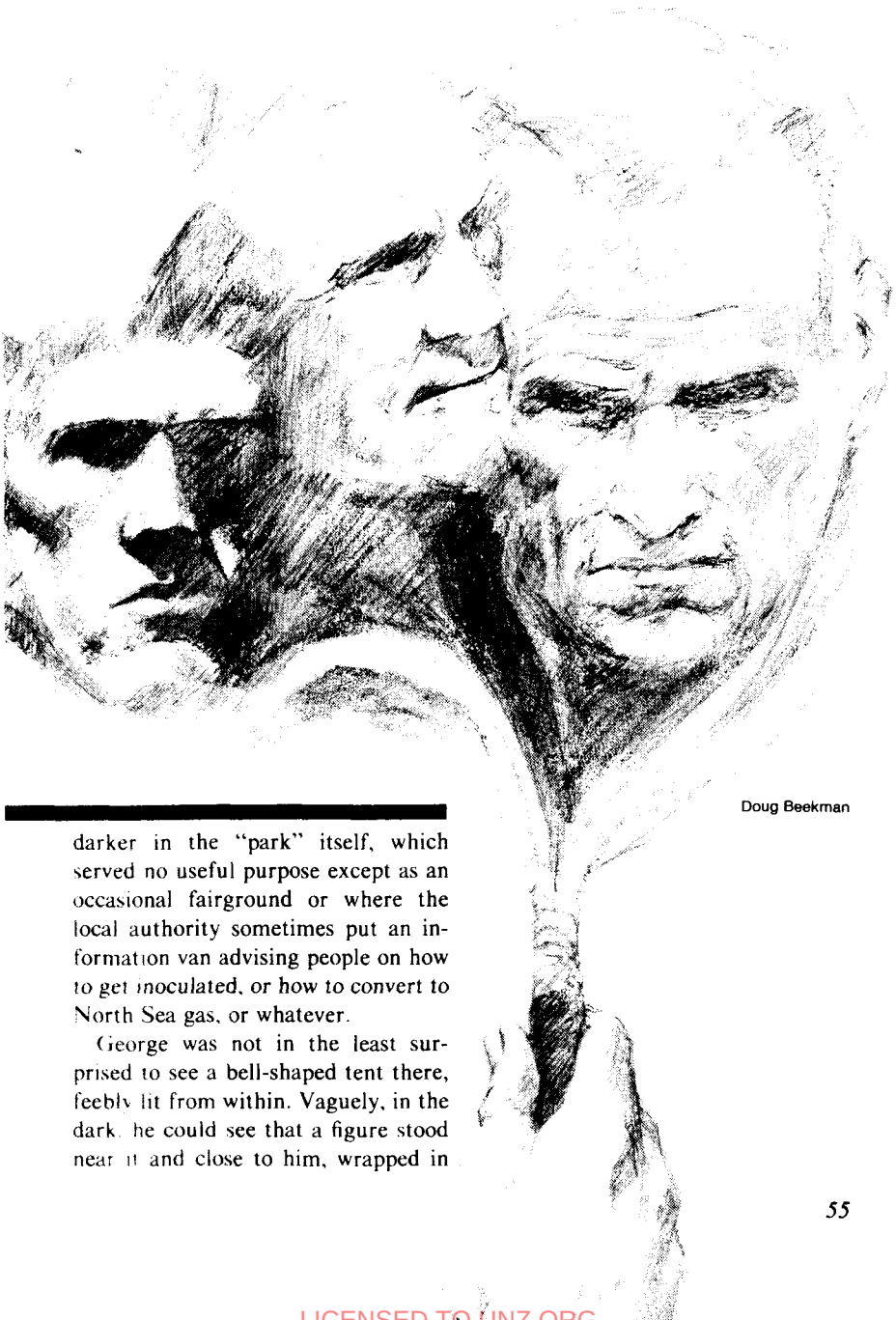

Doug Beekman

darker in the "park" itself, which served no useful purpose except as an occasional fairground or where the local authority sometimes put an information van advising people on how to get inoculated, or how to convert to North Sea gas, or whatever.

George was not in the least surprised to see a bell-shaped tent there, feebly lit from within. Vaguely, in the dark, he could see that a figure stood near it and close to him, wrapped in

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some kind of blanket. The figure held out something to him, a rolled up pamphlet perhaps, or a sample. George took it, the figure still holding the other end of it. It was some kind of soft thin furry cord, which seemed to tingle pleasantly in his hand. He pulled it slightly toward him to try and see it. At that precise moment there was a loud noise. Tock-clock, tock-clock went some sort of alarm in the tent and the figure jumped, fumbling and letting go his end of the cord. He reached for it again but George had turned partly away, and the hand groping in the dark found nothing. The alarm sound changed and went to a higher note. Tock-clock-clock! it went, Tock-clock-clock! The figure seemed to go frantic and George backed away in alarm. A squealing scream now added itself to the alarm note, and the figure made a bolt for the tent.

The faint light went out. Darkness was almost complete, and George never could quite decide what happened next. It seemed for one moment as if the tent had lifted off the ground and vanished upward, but perhaps it was some kind of vehicle which had driven away in the dark. Anyway, George was left holding in his hand what seemed to be some six inches of cord, which seemed to be some sort of sample, and George had a weakness for samples. He put it in his jacket pocket and forgot about it till next morning. Then, while starting to make breakfast and thinking about Julie, he remembered it and got it. It was strange in some way, and of an intricate pattern of weave which he had not seen before, and one end was colored red and the other yellow. With his other hand he grasped the other end. He was so surprised that he held it for a long moment before he dropped it. For one long instant of time, before his hands let go, his mind had been capable of the total recall of every instant of his past life!

He sat down and tried to think, the cord lying on the floor at his feet. Gradually his mind cleared of the thousand snippets of past experience which had flooded in on him in one overwhelming instant. It was a little time before his shattering mental experience had faded far enough for him to suspect that the cord had caused it. It was easy to make sure. He reached down with one hand and picked it up. Nothing happened. Then he remembered and also grasped the other end. Memory! This time it was a full ten seconds before he dropped it. He sat back and panted for a time, trying to recover his mental breath, before he tried again. This time he managed to bear it. It gave him everything. He knew every word of every paper he had ever read, what he had eaten every day of his life, all the pleasant and unpleasant episodes, in full detail, throughout his school days, everything ever said or done to him by parents, brother or sister, the smell of the inside of his pram, and even the warm dark glow of his life prebirth.

It was thrilling. Here was a toy, a tool, a weapon with which to face the

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world. He was the ideal crib, he need never fear an examination again. All that was necessary was to read every word of every book on the subject. He could become the finest accountant of all time if that was what he wanted. But was it? He could make his fortune in any trade as a memory-man. He could easily win any quiz or competition. He could go into politics and make himself invaluable, even famous and great. It was a princely gift which the tent-man (tent? man?) had given him. But was it meant as a gift? He grasped the cord firmly, and remembered everything.

The figure had approached him in the dark and held out one end of the cord. Then there came all the business of the alarm, the fumbling dropping of the cord, the attempt to grasp it again, the failure to get hold of it in the dark, and the panic departure as the alarm became more strident. It hadn't been meant as a gift but as something whose end George was supposed to hold while he held the other. But why. And why did it have this effect now and not then? He had felt nothing unusual when the figure had been holding the other end. Clearly both ends had to be held by one person; George tried letting go first one end and then the other. It made no difference which he held, one end only was not enough.

But why were the ends of different colors? Was one positive and the other negative, like electric wires? Which end had the figure held out to him? The light had been very bad, it was hard to say. He strained at his newfound memory. Surely the end held by the figure was a little darker, in other words the red one. Would holding one end or the other make a difference? If he held the yellow end and felt nothing, did that mean that the person holding the red end also felt nothing? Or did it mean that the red end holder got his thoughts and memories?

He must test it, but how? This thing must be kept secret. He could not just, say, take it down to the pub and try it on someone. Did it have to be tried on a person? After all, was he the same sort of animal as the being who had held it out to him?

Switching off his about-to-be breakfast he hastily dressed and went out to search the streets.

"Miaou?" The friendly neighborhood cat was close to his legs. Just perfect. He kept hold of the red end and pressed the yellow end up against her. At once his mind flooded with cat memories. She had clearly just had a night on the tiles, and let us gently pass over exactly what memories he experienced as being a lady cat in such circumstances.

He rather hastily withdrew the cord. That, as far as the experiment went, was very satisfactory. Now for the other test. He took hold of the yellow end and pressed the red end on the poor unsuspecting feline. He felt nothing, but the cat broke contact by leaping vertically several feet, then taking off at full speed, all fur standing on end, and shrieking as she headed for her home garden. He real-

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ized that life as a male trainee accountant would not please a lady cat, and he had made a permanent enemy.

That was sad, but at least now he knew.

Hold red, and you got his memories, hold yellow and he got yours. Hold both, and you got total recall.

Now he really had the world at his feet, if he used the thing properly. Just suppose that what the giver of the cord had really meant to do was to communicate with him, how easy first to use it to understand the local being, then if suitable reverse the cord and let the being understand him. Perhaps you could then put both sets of "hands" on both ends simultaneously, and then have the most perfect interstellar communication machine anyone could ever dream up.

He went back to his flat and started to draw up a list of the books and publications he would need to read. There was nothing on accountancy in the list, he had read what he needed. He was not going to take the exam, paper qualifications were for small people employed by others, but his life was going to be at the top.

His reading list was that of a future Dictator of the World.

He started reading.

It was a full week before the telephone rang, and he realized that he had been forgetting something. A worried Julie was on the phone asking if he was well and what about things?

George felt he had been neglectful and in any case here was the first real chance to test this device on a person. He arranged to meet Julie that evening in The Plasterers' Arms.

It is a nice old-fashioned little pub, and they sat down in a corner on an old oak bench. George paid for a sherry for her and a beer for himself. Talk went very happily. "I want to show you something strange," said George. He brought out the cord, held the red end, and asked her to hold the yellow one. She did so. He let her hold it for half a minute, then gently took it from her hands.

"Just a moment," he said, and went out of a side door. She waited a long time, but he never returned. She telephoned him next day, but he hung up on her.

What George had seen in that short time was a shallow girl measuring him up as a bed-mate, and not over-fussy about her own person. He might just have tolerated that, as a short term thing, if it had not been for the eight very colorful memories he also got, in total detail, of her previous boyfriends and their actions. Compared to the human race, cats lack imagination.

But poor Julie could not, in any case, have kept up with the George who was now loose on the world. He was heading for money and power the quickest way he knew with the magnificent tool now at his disposal: he was after a legal degree and the Bar.

It took time, but it was not difficult. He needed the time for hunting out the people who would be useful to him for the Bar, on its own, was a long way from the summit of his ambitions.

It was not all work. He was able to

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press the cord up against quite a number of pretty girls at parties, or in crowds or on public transport, and those who suited him, who only wanted a good time, and who would not cause trouble later were easily collected, for very few young men know exactly how a girl wishes to be approached.

A First in Law, and the Bar, were no problem with his equipment nor was getting pupil status with a well-known Queen's Counsel, who was delighted with the young man who always knew exactly what was needed of him.

A number of articles, happily accepted by learned journals, on law, economics and Trade Unionism, helped his career in the field of labour litigation, where he always talked man-to-man with both sides, and soon had a record of success which gave him the nickname of "Settle or Win."

Nobody was very surprised when he offered himself as a Conservative candidate in a strongly Labour area. His talks with all the union bosses of the area and everyone else he could (literally) lay hand on, with his cord up his sleeve, left a widespread public opinion that "he knows our problems." He lost at the election as he knew he would but he left the winner's majority in rags and his own reputation sky high. Then there came the Bossington by-election, a working area with dormitory fringes which made it a possible Conservative win.

George was a young man from nowhere, but he had private talks with several leading local Conservatives, who felt he understood their needs, and he had his record as a successful lawyer, as a writer, and as the hero of a well fought fight.

They chose him, and he fought and won.

The new Member for Bossington was a great success. His powers of accurate quotation without notes or preparation simply flattened his opponents. He was also building a fortune, as he was literally in touch with many rich city men who knowingly or unknowingly gave him much useful information.

It was about then that he met Diane Harte, daughter of an old family and a considerable heiress on her own account. As everybody knows, a man can look like the less attractive side of a sewage works and still attract girls if he has other qualities.

George was young, but his rather ordinary looks were now cloaked in an air of assurance which gave them power. Diane wanted to have a big family in a big house and be a great hostess to some powerful leader of men who would give her love and satisfy her physical needs, which were uncomplicated. They met at a party, met again, and the third time they found a mutual bed. Diane had the word "yes" ready well before George asked for it, and the wedding guests included politicians who were pleased to be photographed near a rising young man. The marriage was very happy. Not every woman is truly convinced that her

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husband fully understands her, and there was soon a set of children too.

Meanwhile the capable young Member for Bossington had grown in reputation for his understanding of the minds of Trade Unionists, and was the only obvious person to appoint to be Under-Secretary to the Ministry of Labour.

Now his photograph was often in the papers and on television. There were photographs of the cord, too, which he carried "as a lucky charm."

George knew the real secret of his success, and what he was risking, but he had secret high plans for his life. He was therefore not caught unprepared the evening when he went walking alone in the warm dusk of his lovely country house garden. Three blanket-cloaked figures appeared from among the bushes. One pointed something at him which he knew must be a weapon, and another held out a cord toward him, yellow end on.

He waved it away and held out his own cord, yellow end on, and one of the visitors took hold of it.

They had come to collect the cord. It was impermissible to leave such a high technology artifact on such a low-level planet. They had watched for years for the effects such a cord would have, and had monitored local television and seen it.

They demanded it back. George smiled and bowed and let them keep it. They seemed surprised that he agreed so easily, but they left.

The next morning George wrote to the Prime Minister, resigning his government post and saying that he intended to leave the House of Commons as he found it too great a strain on him. He would be happy to serve in some less strenuous manner. The answer came by special messenger. The Prime Minister was greatly saddened at the thought of losing such a valuable colleague. He was glad that George felt able to serve in some less arduous capacity, and wished to know if he felt he could continue to work if perhaps a Peerage could be arranged for him.

George agreed at once, and a day some weeks later saw the introduction of George Spiner, Esquire, in the House of Lords, to have and to hold the name, dignity, title and honor of Baron Bossington, for his life.

Whatever the Prime Minister expected of him, in fact Lord Bossington didn't attend to his Parliamentary duties all that regularly, in which habit I regret to add he was like five out of six of all recently created Peers. The fact was that he was busy. He had equipped an old coachhouse on his estate as a very special electronics laboratory and from this emerged after some years an astounding array of patents relating to motors and to methods of transport and propulsion. They were all put into the name of a new company, the Bossington Agency. This was surprisingly well financed. While Lord Bossington was its Chairman, he left all the work to his deputy and the Board who, in a relaxed moment he once stated, were in complete accord with his ideas. He himself

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was busy elsewhere.

It was not till it became clear that the new motors and equipment were only going to be sold to Bossington-controlled companies that industry and transport panicked. Once they let his frictionless motors and transport into competition with them they were all bound for the scrap heap. They joined the unions in demanding his nationalization.

They didn't get it. Other nations panicked as they saw all this new technology about to pass into British Government hands and it was the *inter*nationalization of the Bossington Agency which was demanded at the United Nations. Argument flew back and forth for long months while the Bossington Agency quietly developed. George was the busiest of all: he was training his two eldest sons.

James and William were brilliant, some said as good as their father. They were now aged twenty and nineteen, and both had been given jobs outside the Agency as his personal assistants. They had also been put in control of his corps of personal bodyguards. They were the only people he had trusted with the secret of the cord, after a lifetime of probing their minds.

They had one pressing problem which they had to solve or accept defeat. That the aliens would return seemed obvious. If they did, they would not make the same mistake. This time they would probe George's mind and learn not only how much he had learnt from them, and his ambitions, but also how he proposed to protect himself from them.

George and his sons had to limit the spread of the secret of the cord, but by so doing they left themselves open to attack by the aliens, who could remove secrets from a limited number of people and places.

But what if everyone on the planet knew about cords? Would they kill everyone and sterilize the planet? George's intimate knowledge of their minds allowed him to be certain that they would not.

A computer can keep a secret better than any human, and it is trebly secure if not only the retrieval key is secret, but also if nobody knows there is a secret locked in there, or even that a secret exists which needs hiding.

What they needed to do was to feed the secret of the use and construction of the cords to a computer which was linked to the main planetary computer system, with orders to pass it to all other computers and to put it in each under a coded security lock. The unlocking key must not be known to George, nor must he know who had it, or the aliens would find it and destroy the secret. It had to be invented by the computer itself.

It was necessary to draw up a set of possible happenings to George and the boys and the Bossington Agency, and this had to include absolutely anything that could go wrong. This list had to be fed into the computer with instructions to other computers to put out the key signal to all other computers if any of these things happened and were

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recorded. Also they must not accept the key except from other computers. Since there were now many millions of computers on the planet, dealing with everything from ticket collecting to sewage and government, and all of them would be affected in some way by any change in the Bossington Agency, the signal was bound to go out if anything went wrong, and any attempt at the destruction of all the computers would wreck the planet. The aliens must face the alternatives of the preservation of Bossington Rule, racial murder, or universal knowledge of cords.

Only one other thing was necessary, and that was the order to the original computer to wipe its memory of the whole transaction. Now not even George could stop universal knowledge of the construction and use of cords if he and his line lost control of the planet. It became positively in the interest of the aliens to keep him and his descendents in the saddle as planetary rulers by all means in their power.

If George's schemes went wrong or were frustrated all the world would know how to make cords, the civilization of the world as we know it would be totally changed, and even George and his sons had no way of knowing how to stop it.

They were just in time. His estates were now walled, wired and fortified, but blanket wrapped figures again appeared in his garden at dusk and this time they insisted that George take the yellow end of a cord. He restrained his sons, who might have gone to his defense, and grinned as he grasped it. The alien howled! He turned to his companions, "Baggle baggle baggle," he said or words to that effect.

George roared with laughter, and all three laughed as the aliens left in a hurry. They could now never suppress the escaped knowledge without sterilizing the whole planet.

How long the United Nations would have been on deciding what to do about the Bossington Agency will never be known, for the Agency itself now stepped in. It proposed that each nation suggest twelve possible names of representatives for an international committee to supervise its Board, of which the Agency would choose two for each country. This was at once agreed on—George had been busy meeting people—and the new committee chosen and formed.

From the very beginning it was a strangely unanimous body, and therefore the most effective part of the United Nations. It tended therefore to be the preliminary sounding board where nations went if they wanted to get something agreed. It already covered a large area of the planet's life, as it controlled all supplies of the new technologies to industry and transport. Simply, that meant full control of everything.

But Bossington is such a long word. Why use it when everyone knows what you mean when you speak of the Agency?

And they have shortened George's name too. Many people now just call him the Lord Boss. ■

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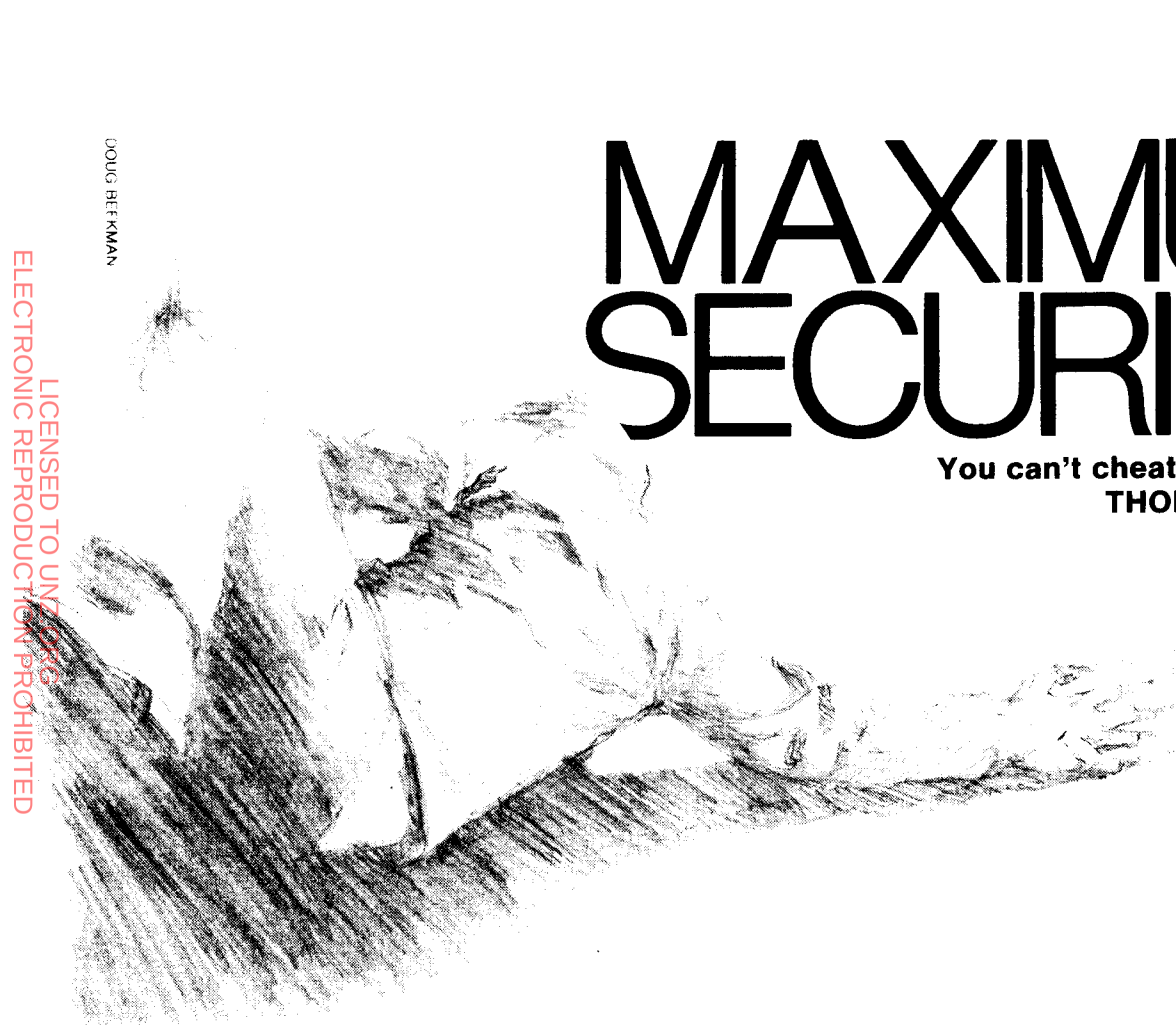
DOUG BEERMAN

MAXIMUM SECURITY

You can't cheat an *honest* man.
THOMAS SULLIVAN



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He sat cross-legged on the floor, a muddy lump of a man, highlighted only by yellow scleras that cupped his fixed brown irises. The blood was draining out of his brain and into the prison. It did that. Enervating walls. He'd felt that way the first time, long ago, and every time since. And every time he'd tried to escape and failed. Like this time.

. . . *the sewer line is screened, Hack*, he repeated to himself with vapid patience . . . *the sewer line is screened.*

Mechanically he drew his right hand to his brow, swiping away a rivulet of mud.

The corridor receded endlessly in one direction, a warm tundra of soft plastic. The inside of an egg. Its lighting belied corners. Small and compact and still, another man sat on the floor perhaps fifty meters away. He had a straitjacket on. Post-suicide attempt. Placed in *the womb* to recant the only sane resolve that was possible at Dexter Maximum.

Poor dumb bastard, thought Hack Guernsey. "Hey," he said aloud.

The word fled instantly into the walls, without stirring the straitjacket.

"Hey!" Hack said louder.

There was a faint, causeless click and symphonic music began to swell through hidden speakers. The "keys" were watching, listening, forbidding.

Hack Guernsey struggled to his feet. "Hey!" he shouted as loud as he could and took a determined step toward the man. Swiftly, silently, out of nowhere, the white panel came down. For a moment he blinked at it, and then the vitality he had let flow out of himself came rushing back. He gulped air in aching lungfuls, his face sprouted iron wrinkles, decades of lost time roared out of his soul. Screaming incoherently he sprang at the wall and beat with his fists until his hands were numb and the blood flowed from his palms. In the end he sank to the floor again and sobbed like a child. Above him were the five vertical marks left by his retreating hand. Quintessential Hack Guernsey. Mud and blood.

"Harold Guernsey . . . I remember," Dr. Ashton was saying. He sniffed and nodded, dwelling on the clipboard rather than on Hack, who sat scrubbed and shirtless on the edge of the examination table, hands swathed in gauze.

Hack didn't like him. This smug doctor who leered over the tops of his glasses and wagged a scepterlike finger—punctuating, mesmerizing, tweaking his leaky nose with it like the gentle double slap of a challenge or a scale model windshield wiper. His voice was also mesmerizing, purring with secrets and private humor. If they had met in a bar, Hack might have launched a good one at him just to change his expression. Ruefully he gazed at his shrouded fists.

"You robbed a Cartier agent of a half million in diamonds," reflected the doctor.

"And killed the courier," Hack said significantly.

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"Yes. I knew you got life."

"That's right."

"No parole. And the diamonds never turned up."

"And never will."

The doctor smiled.

"Unless you get out," he said. "I want to see you Friday. Leave the gauze in place and don't be modest. Let the guards help you when you go to the bathroom or—"

"What do you mean *unless I get out*?"

The doctor shrugged, and his effeminate Gioconda smile confirmed some hidden implication.

"You mean if I escape," Hack concluded for him.

"No. I didn't mean that."

"*Damn* you, don't play games," Hack rumbled intently, pouring off the table like a lithe cat.

The doctor's smug manner wavered as if he were facing an inflated cobra.

"There's always clemency," he said hastily. "Disability clemency."

"That's for vegetables."

"Not necessarily."

"Tony Dill got that right after he lost both hands in the stamping plant. What good is a safecracker with no hands?"

The doctor's tongue slid sluglike over his upper lip.

"Aging is a disability," he said.

Hack absorbed the puff of antiseptic breath that contained those words, still a cloud of hidden meaning.

"I ain't old. What the hell are you getting at?"

"You could be old. Now. It's not impossible." Suddenly the man was flowing with explanations. Aging was a disease, a cellular malfunction. Death hormones. The proper signal, and the body rapidly deteriorated. Premature aging as a pathological condition even afflicted children sometimes. There was a word for it. *Progeria. Progeria*, the doctor said twice. Hack never did get it. But he understood the rest about the little green phial in the glass cabinet, and about the orange one next to it. "The green one will induce *progeria adultorum*, the orange will kill the cellular toxins and slowly your body will return to its youthful state as the cells replicate themselves normally."

Hack Guernsey was not in a youthful state. But *normal* was good enough for him. He drank in the possibility as if it *was* a fountain of youth. To a "habitual," with no hope of anything but panels sliding between him and the outside world, it was an elixir of life, not death. He had no questions about the medical safety, about side effects. The choice was simple, an Alice in Wonderland choice. Beyond the pale of this white-cloaked rabbit and his repertoire of chemical tricks he saw a post-suicide attempt sitting in yesterday's straitjacket.

"*I* will get the diamonds, of course," said the doctor.

"Of course," said Hack Guernsey.

Placed on a sugar cube, the green substance promised sweet lime but lied. It was tasteless, and it made the sugar tasteless, too.

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The days to follow were a succession of mirrors. Hack sought out his image in the library showcase, the coffee urns at mess, the chromed vehicle parts in the garage where he worked, in mirrors themselves, and in the eyes of his friends. His "vanity" was remarked, nothing more. But when it began to happen, it didn't happen in mirrors. It happened within.

There was the stiffness. Movement became stress. Motions had to be practiced, joints primed before they performed painlessly. Just as the mirror-looking was not vanity, but something quite different, the stiffness did not connote loss to him. It was renewal. Hack Guernsey's eyes gleamed triumph. Energy, appetite, reflexes, digestion, hearing, all underwent subtle deteriorations before the puffiness showed. And when it did, the others were a long time noticing.

"Not yet," Dr. Ashton would tell him on Fridays. "I don't want to treat you for something that isn't wholly evident."

"If it's curable how can you convince a clemency board to release me?" Hack was asking, having second thoughts.

"Leave that to me," Ashton would smile confidently. "Has your isolation mate noticed *any*thing yet?"

"No."

Hack's iso-mate, a nervous, myopic embezzler named Clarence, was hard-pressed to draw a visual line between himself and a doorway three meters away. For two years Hack had systematically reduced him to the rank of body slave by physical intimidation. "Hey . . . Chief of Commode," he might say, "your turn to clean the toilet." It was always Clarence's turn to do whatever had to be done. And he did so willingly—as long as the demand was not too great—to gain security for himself. It was, therefore, a surprise to Hack when Clarence aimed his lens-magnified blue eyes at him from the edge of his bed one morning and chattered rapidly:

"Jeez, Hack, I don't know what's wrong with you, but there sure as hell is somethin'. You look terrible. You got a skin disease or somethin'? 'Cause if you do, I just wantcha to know I got allergies. Severe allergies. And I can't afford to get nothin'." The look he received was so benevolent that Clarence ventured further. "I mean like it could be contagious, you know. You oughta go see a doc."

Hack beamed at himself in the mirror. So this was it. What had been obvious to him for a week past was now "wholly evident." His hair was lusterless, graying, his skin sagging, he seemed to have shrunk. The next three days produced several alarmed reactions from his friends. Behind his failing exterior Hack Guernsey glowed as though he had reached puberty.

"It's time," Dr. Ashton confirmed on Friday.

"To tell the clemency board?" Hack said eagerly.

"To start keeping a file on you, my dear Harold. You aren't nearly old enough yet."

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Harold. He felt like a *Harold*. There had been a certain virile pleasure in being Hack. That name was a blow on the ear, onomatopoeia to even the most prosaic mind. Now he was Harold Impotent.

And contagious.

That's what Clarence thought. He began to shun the articles Hack touched, and he slept face-away from his iso-mate with the sheet drawn up to his nose. By day the news spread. Curious inmates made sight-seeing tours in Hack's vicinity, old enemies regarded him with fearless eyes, friends rejected him as though he were a memory. Clarence became interpreter of the oracle, and when he said it was "downright creepy" to have that kind of sickness around, the whole wing became restless. Somewhat less enthusiastically than before, Hack smiled to himself.

He wanted to get it over.

But "Doc" Ashton continued to make voluminous notes while Hack underwent pseudo-testing. Privately, the doctor would tell him that his respiratory capacity and elasticity were diminished, or that fibrous tissue was multiplying inside him and that this was good. Hack listened without understanding, and gradually his sense of triumph chilled at the awful sounding progression of impairments. Each morning brought a new thrill of horror to the mirror, sleep was never long enough to prepare him for the latest corruption of flesh peering back as if from an unfamiliar photograph. *I'm chickening out*, he realized. *Got to hang on.* But it seemed his will was deteriorating also.

"Big deal!" he rasped at Clarence one day. "I got a disease. Doc says it ain't contagious, but you shot your mouth off all over the prison and now nobody believes me."

"I don't think your doctor knows nothin'!" Clarence chattered back. "Nobody ever heard of what you got. It's unnatural. Some kinda new virus, or a—a germ warfare thing! Stay away from me, Hack. Just stay away—"

"And what're you gonna do if I don't, huh?" Hack swung off his bed, wiggling fingers at him.

Clarence's eyes fairly bulged behind their thick lenses. "Don't come near me. I'll call the keys."

Hack advanced, senile glee radiating from his face. "Call the keys. Tell 'em your iso-mate threatened to touch you. Like this!"

In desperation Clarence struck out. It was a powder-puff swing that caught Hack square in the chest, but it dropped him coughing and wheezing to the floor. Clarence stared in amazement from his bed where he had leaped after throwing the womanly punch. *My God*, he thought, incredulous at the collapsed shell of a man on the floor. And then he did call the keys.

"Hack's having a fit," he told them when they arrived. "It's the disease. Better move him to the hospital."

"I'll . . . get you . . . " Hack spluttered asthmatically from a scarlet face.

Clarence made a note to watch the

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guards who were carrying him off for symptoms.

Hack never went back.

His chest was bruised and he experienced difficulty breathing for some days, but the reason he stayed in the hospital was for observation of his condition. That was all right with him. In his heart he knew he could never face Clarence again, knew that vengeance would have to wait until he was restored. He would have the last laugh. But the clemency board had to come through. The clemency board. That was what he must think about. Vague misgivings began to haunt him. What if the board turned him down? What if Ashton dropped dead and the orange antitoxin was somehow lost? It was odd, but ever since he had swallowed the lime-tinctured sugar cube he had *felt* green inside. Fungus-ridden. On top of everything else, the stuff had dyed his imagination green.

Ashton's face lingered over him day by day, as if he were reading a morbidly fascinating horror story whose chapters were still unfolding. There was a certain macabre humor in it that frightened Hack Guernsey. His voice grew thinner and higher, his facial hair scanty, bowel movements were irregular, and one ghastly afternoon a male nurse cheerfully explained the tendency of the sexes to approximate each other in old age. With perhaps his last impressive tirade, Hack cursed him from his bedside. No longer could he leave the hospital.

"You're ready," Ashton told him soon after. "I've submitted my recommendation."

Five days later the board ordered his release to a nursing home. Hack heard the news from Dr. Ashton who had summoned him to his office in a wheelchair.

"And now the diamonds," said the doctor softly when Hack had received the news expressionlessly. There wasn't room for another expression on his carved and ancient face.

Hack's finger made a warped gesture toward the glass cabinet where a pair of phials—one green, one orange—sat.

"First the diamonds," Ashton insisted.

Again the finger lifted off the chair arm.

"Now . . ." Hack breathed with scarcely a voice.

Ashton poured himself a cup of coffee from the pot behind him and set it down to cool. "How do I know you're not too senile to remember where you hid them? If I give you the restorative you may conveniently forget."

Hack became stone, the only means left of enforcing his will.

"I see," Ashton said after a few moments. He rose up, unlocked the cabinet, removed the orange phial. But his cold glance rebuffed the flicker of hope in Hack's eyes. "We're out of sugar cubes," he said then. "I'll go get some."

As he swept silently past carrying the restorative, Hack's eyes were on the bowl next to the coffee pot, above

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which, he sadly noted, was the snowy white corner of a sugar cube.

Outside the room, the doctor picked up a phone.

"Warden," he directed in a whisper. "Hello? Warden, this is Ashton. I've got a problem here with the new clemency release. He's balked on the diamonds. Should I give him the restorative and let him think he can be cured? . . . Yes . . . Yes, I know . . . I just didn't want the responsibility if Carter's doesn't recover the diamonds. . . . Yes, I think so, too. In any event, we've satisfied the Prison Population Board's decision. He won't be on our rolls anymore. . . . No, I don't see that it will matter. He'll be too weak and senile to communicate effectively. Like the others . . ."

Relieved of blame, the doctor flipped the phial once in his hand and returned to his office.

"Well, the sugar cubes were here all the time," he said, going to the window ledge. "My secretary must have moved them."

He placed a drop of orange fluid on a cube, offering it to Hack.

"Now, where are the diamonds?" he asked pointedly.

Hack continued to stare straight ahead, the sugar cube in his fingers. He was remembering Tony Dill and his disability clemency. Tony Dill who had lost both hands in a prison stamping plant "accident." *What good is a safecracker with no hands?*

"The diamonds are in locker thirty-seven B at O'Hare," he whispered.

"Thirty-seven B?"

Hack crumbled the orange cube between his fingers and slowly wheeled about. The doctor watched him glide through the doorway, then shrugged. Perhaps the diamonds would be there, perhaps not. The irreversible effects of aging had rendered Hack Guernsey harmless either way.

As he drank his coffee, he noticed it lacked the usual robust color, but he failed to glance at the empty phial, tinged with emerald residue, in the unlocked glass cabinet. ■

IN TIMES TO COME

The space program is far from dead—it's merely the American *space program that is currently in the doldrums. In next month's issue, we'll feature a "Salute to Salyut," by James Oberg, and a startling Guest Editorial by Donald Kingsbury, "The First Space War." That war, by the way, has already been fought!*

Jack Williamson's fine interconnected series of stories comes to its rousing conclusion in "Brother to Gods," the lead fiction in December's issue. Jack Gaughan has painted a startling cover illustration to go with the novelette.

Frank Herbert is known for his serious, lengthy novels, such as the Dune Trilogy. But in our December issue, Herbert joints forces with F. M. Busby to produce a truly funny short story, "Come to the Party," which features the most lovable man-eating monsters you ever saw. And John Gribbin makes a valuable contribution to State of the Art with his, "Science Fiction Is Too Gloomy."

We'll also have more stories, and all the usual departments. In December.

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If you were transported back through time to visit your very distant ancestors—*Homo habilis,* for example—would you want to live with them permanently?

SPIDER and JEANNE ROBINSON

SYNOPSIS

Unable to achieve artistic recognition on Earth, Shara Drummond had come to space, to the orbiting industrial complex of Skyfac Incorporated, to become the first zero gravity dancer. There she died—for a body acclimates to free fall irrevocably—*but not before she served as a kind of interpreter between mankind and a swarm of apparently aggressive aliens from deep space, who communicated by the universal language: dance. The oft-imagined First Contact turned out to be essentially a "duel of dance"—which Shara's* Stardance *had won, driving the aliens from Earth's orbit and beyond territorial detection. Drained by the combat, and unable to return to the planet she had saved, Shara perished in flames in the upper stratosphere.*

She was survived by her older sister, Norrey, and by me: Charlie Armstead, Shara's video man. I taped the Stardance, *and when that tape became the most wildly acclaimed artistic event of the century, Norrey and I (who had been good friends and occasional lovers for over twenty years) used the profits to establish* The Stardancers, *a zero gee dance company, in Shara's memory. With Tom McGillicuddy, a former Skyfac exec turned dancer, and Linda Par-*

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sons, a wise and empathic young dancer from a commune background, we created the new kind of dance as Shara had envisioned it, in an orbiting dance/video studio designed and built by Harry Stein (the most experienced free-fall engineer alive), with sets, lighting and music created by Raoul Brindle, a slight, bespectacled genius. We all divided our time between taping zero gee dance for commercial release and attempting to train new dancers for our company.

We experienced enormous and unexpected difficulty with the latter: for as we slowly learned, the ability to function without a clearly defined "up" and "down," without a "local vertical," is an extremely rare and unpredictable talent. Perhaps fewer than one in a hundred can ever learn to perceive spherically, *to coordinate in the absence of a linear perceptual set. It is not weightlessness per se that is the problem: Skyfac personnel function in low or no gee—so long as they have an environment of right angles, an arbitrary "up" and "down." But in free space, most people become hopelessly disoriented and panic-stricken.*

But the six of us were among the rare ones who could live without a local vertical. We lived contentedly in free fall, inventing new artistic methods as we went along, and acquiring spiritual grounding and insight from the daily contemplation of infinity inherent in space life. I began to lose the armor of cynicism, the perpetual bitterness I had been steeped in ever since (in my early twenties) a burglar's bullet had smashed both my right hip and my potentially brilliant career as a conventional Modern dancer (my gimp leg was quite adequate for zero gee). Norrey and I got married. Tom and Linda became lovers. The whole company became a true family, as we came to realize that free fall dance requires something like mutual telepathy. The tension which, in normal dance, is provided by gravity, must in space be provided by each other*—forcing us to become as attuned to one another as acrobats, constantly solving at least four-body-problems in our heads and outguessing each other's next moves.*

Then the swarm of alien fireflies, which had brought death to Shara, reappeared.

They were spotted in the close vicinity of Saturn, which just happened to be the extreme range-limit of the largest manned space probe the U.N. Space Command had. The launch window just happened to be open. They just sat there and waited. Frightened away from their first attempt at communication by a shotgun blast named Shara, the aliens had crept back to the fence gate, and were politely waiting to be noticed. They were learning country manners.

And we Stardancers were drafted.

The large probe, Siegfried, *was outfitted as a diplomatic mission, with us as the "interpreters" (who else "spoke" zero gee dance?), and sent by a unique orbit to the Saturn System, where it would use Titan as a*

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kind of "gravity brake." This would cut the trip time down to a year— but most of that year would necessarily be spent in free fall!

Diplomats, dancers and crew alike, our bodies adapted irrevocably to zero gee. Our planet was lost to us. We would never walk Earth again.

We spent the outbound year getting to know our six companions. Skipper was Bill Cox, who had been there when the Stardance was taped; his second in command was Col. Susan Pha Song, a Vietnam war orphan and physicist. The diplomats were a Big Three team: Ludmilla Dmirov, a dour dogmatic idealist; Chen Ten Li, a canny and dangerous chess player; and Sheldon Silverman, a political opportunist and a poltroon. They were led, at least in theory, by the proverbial Man Above Reproach: Ezequiel DeLaTorre, a wise and weary statesman whom I immensely respected.

In that year we six Stardancers came to realize that free fall life had wrought a subtle but pervasive change in us. We were something more than exiles from Earth: in learning to perceive spherically we had learned to "think as well as a human, but not like a human." Our lives had changed (for the better—we were more stable in weightlessness) in basic and profound ways. We were at home in space.

We were, if not more than human, at least other. Our interests and those of the diplomats did not necessarily coincide.

We spoke of this only when we were alone together in space, our radios shielded. But Chen Ten Li bugged one of our p-suits . . .

Just before we reached Titan he asked to be conducted out into free space, for "spiritual" reasons, and while we were in the privacy of the transparent observation cube called The Die, he and I had a brutally frank conversation. He agreed, at least in theory, that we Stardancers were other-than-human ("Homo novis"), that we were a new and unknown factor in the balance-of-power between him and his codiplomats. He told me that if the immiment conference with the aliens produced any strategically crucial information, he believed that Silverman would try to somehow "steal the secret" for America. He announced his intention to kill Silverman if this happened. He asked me where we Stardancers would stand, in a showdown . . .

Instead of answering, I suggested to Chen that he might be Homo novis too. But he proved to me that he was not: that he could not live without a local vertical, that, like all the other diplomats he could not adapt to free space. We Stardancers might be Homo novis but he and the others were only Homo excastra: citizens of Earth, forever exiled.

And then Titan was upon us, and the alien swarm that had cost Shara Drummond her life . . .

CHAPTER EIGHT

Deceleration brought a horde of mi-

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nor disasters. If you move into a small apartment (and never leave it) by the end of a year your belongings will have tended to *spread out* considerably. Zero gee amplifies the tendency. Storing *everything* for acceleration would have been impossible even if all we'd had to contend with was the twenty-five hours of a hundredth gee. But even the straightest, laser-sighted pipeline has some kinks in it, and our course was one of the longest pipelines ever laid by man (over a billion klicks). Titan's gravity well was a mighty small target at the end of it, that we had to hit just precisely right. Before Skyfac provided minimicrochip computer crystals the trick would not have been possible, and we had had small course corrections en route. But the moon swam up fast, and we took a couple of one gee burns that, though mercifully short, made me strongly doubt that we could survive even a two year return trip. They also scattered wreckage, mostly trivial, all over the ship: Fiber McGee's Closet, indoors. The worst of it appeared to be a ruptured water line to the midships shower bags, and the air-conditioning handled it.

Even being forewarned of an earthquake doesn't help much.

On the other hand, cleanup was next to no problem at all—again, thanks to zero gee. All we had to do was wait, and sooner or later virtually all of the debris collected on the air-conditioning grilles of its own accord, just like always. Free fall housekeeping is mostly replacing worn out velcro.

(We use sleeping webs and cocoons when we sleep, even though *everything* in a free fall domicile is *well* padded. It's not as restful—but without any restraints, you keep waking up when you bump into the air grille. One idiot student had wanted to nap in Town Hall, which has no sleeping gear, so he turned off the air conditioning. Fortunately, someone came in before he could suffocate in the carbon dioxide sphere of his own exhalations. I paid for an unscheduled elevator and had him dirtside twenty hours later.)

And so nearly at once, everyone found time to hang themselves in front of a video monitor and eyeball Titan.

Titan is the sixth of Saturn's nine moons, and quite the largest. It orbits almost precisely around the equator of Saturn (as does the Ring) at a distance of just over ten planetary diameters. I was expecting something Luna-sized or smaller—but the damned thing is the size of the planet Mercury, about half the size of Earth. They grow 'em *big* in that neighborhood.

From the time it had been close enough to eyeball it had looked reddish, and now it looked like Mars on fire, girdled with vast clouds like thunderheads of blood. Through them lunarlike mountains and valleys glowed a slightly cooler red, as though lit by a gobo with a red gel—which, essentially, they were. The overall effect was of hellfire and damnation.

That preternatural red color was one of the principle reasons why Cox and Song went into emergency over-

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drive the moment we were locked into orbit. The world scientific community had gone into apoplexy when its expensive Saturn probe had been hijacked by the military, for a diplomatic mission, and into double apoplexy when they understood that the scientific complement of the voyage would consist of a single Space Command physicist and an engineer. So Bill and Colonel Song spent the twenty-four hours we remained in that orbit working like fishermen when the tide makes, taking the absolute minimum of measurements and recordings that would satisfy *Siegfried's* original planners. Led by Susan Pha Song, they worked from taped instructions and under the waspish direction of embittered scientists on Terra (with a transmission lag of an hour and a quarter, which improved no one's temper), and they did a good, dogged job. It is a little difficult to imagine the kind of mind that would find chatting with extrasolar plasmoids *less* exciting than studying Saturn's sixth moon, but there are some, and the startling thing is they're not entirely crazy.

It's that red color. Titan should look sort of blue greenish. Yet even from Earth it is clearly red. Why? Well, the thing that had professors in a flutter was that Titan's atmosphere (mostly methane) and temperature characteristics made it about the last place in the solar system where theory grudgingly admitted the possibility of "life as we know it." Experiments with a Titan-normal chamber produced Miller's "primal flash" chemical reactions, a good sign, and the unspoken but dearly beloved theory was that maybe the red cloud cover was organic matter of some kind—or even conceivably whatever kind of pollution a methane breather would produce. I couldn't follow even Raoul's popularization of the byplay, and I was only peripherally interested, but I gathered that by the end of twenty-four hours, a pessimist would have said "no" and an optimist "maybe." Raoul mentioned a lot of ambiguous data, stuff that seemed self-contradictory—which didn't surprise me in light of how prematurely *Siegfried* had been rushed into commission.

I divided my own attention between Titan and Saturn, which the scientists wouldn't be interested in until after the conference, when they could get a closer look. From where we were it took up about a 6° or 7° piece of sky. (For reference, Luna seen from Earth subtends an angle of about half a degree; Earth seen from Luna is about 2° wide. Your fist at arm's length is about 10°.) And the Ring, edge on to us, added another couple of planetary diameters or almost 14°. Call it a total package of 20°, two fists' width. Not cosmic; at home, at the Studio, I've seen Mother Terra take up more than half the sky at perigee. But when Earth *did* take up 20°, we were about 22,000 klicks from its surface. Saturn was 1.2 *million* klicks away.

It's a hellacious big planet—the biggest in the system if you don't call Jupiter a planet. (I don't call it at all. It might answer.) Its diameter is

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roughly nine Earths, and it masses a whopping ninety-five Earths.

Its mighty Ring appears to be a moon that didn't make it, uncountable trillions of orbiting rocks from sand to boulder size, all of them covered with water ice.

Together they present an indescribably beautiful appearance. Saturn is a kind of dreamy ocher yellow with wide bands of dark, almost chocolate brown, and it is quite bright as planets go. The Ring, being dirty ice, incorporates literally every color in the visible spectrum, sparkling and shifting as the independent orbits of its component parts change relation. The overall impression is of an immense agate or tigereye circled by the shattered remnants of a mighty rainbow. Smaller, literal rainbows come and go randomly within the orbiting mass, like lights seen through wet glasses.

It was a sight I never tired of, will never forget as long as I live, and it alone was worth the trip from Earth and the loss of my heritage. I couldn't decide whether it was more beautiful at the height of our orbit, when we were above the Ring, or at the other end when we were edge-on; both had their points. Raoul spent virtually every minute of his free time glued to the bulkhead across from his video screen, his Musicmaster on his lap, its headphones over his ears, fingers seeking and questioning among its keys. He would not let us put the speakers on—but he gave Harry the auxiliary 'phones. I have subsequently heard the symphony he derived from that working tape, and I would have traded Earth for *that*.

The aliens, of course, were the utter and total center of Bill Cox's attention. He had to use instruments, they were too far away to be seen. About a million klicks, give or take a few hundred thousand, waiting with apparent patience at the approximate forward Trojan point for Saturn-Titan. The actual location of the point is extremely complicated by the presence of eight other moons, and I'm told that no Trojan point would be stable in the long term—even if the O'Neill Colony movement ever gets going at L-5, it'll never spread to Saturn. But what it came down to was that the aliens were waiting about 60° "down the line" of Titan's orbit, at a sensible place for a conference. Which made it even more probable that that was their intention.

So *our* next move was to go say howdy. *Siegfried* and all: that Trojan point was a good four light-seconds away, and lag was not acceptable to any of us.

We dancers also had business of our own to occupy us while Bill and Colonel Song were slaving, of course. We didn't spend *all* our time rubbernecking.

The limousine had been fully supplied and outfitted, field and board tested down to the last circuit and secured long since, in transit. So naturally the first thing we did was to check the supplies and fittings and board test down to the last circuit

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again. If we should buy the emptiest of farms, the next expedition would be two or three years in arriving at the very least—and maybe by then the aliens' Trojan stability would decay enough to irritate them and they'd go home.

Besides, I wanted personal words with them.

And *that* was the root of the *last* thing we did before blasting for their location, which was to hold the last several hours of a year long quarrel with the diplomats over choreography.

I finally jaunted right out on them, prepared to float in my room and let *them* dance. I hadn't lost my temper; only my will to argue. DeLaTorre waited a polite interval and then buzzed at my door.

"Come in."

The free fall haircut spoiled his appearance: he should have had hair like Mark Twain. He had had to shave his beard too—there's no room for one in a helmet—and hating shaving, he did it badly, but it actually improved his looks, almost enough to compensate for the big fuzzy skull. His warm brown eyes showed unspeakable fatigue, their lids raisinlike with wrinkles. He stuck himself to the wall, moving with the exaggerated care of the bone-tired, so that he was aligned with the local vertical built into it by its terrestrial designers. (When Harry builds his first billion dollar spaceship, he'll be more imaginative).

DeLaTorre would, at his age, never make a Space Man. Out of respect, I assumed the same orientation. What little anger I had had was gone; my determination remained.

"Charles, an accomodation must be reached."

"Ezequiel, don't tell me you're as blind as the rest of them."

"They only feel that the *first* movement might more properly be respectful, rather than stern; solemn rather than emotional. Once we have established communication, opened relations with these beings in mutual dignity, then would be the time to state our grievances. The third or fourth movement, perhaps."

"Dammit, it doesn't *feel* right that way."

"Charles, forgive me, but—surely you will admit that your emotional judgment might be clouded in this matter?"

I sighed. "Ezequiel, look me in the eye. I have not been in love with Shara Drummond since shortly before she died. I have examined my soul and the dance that came out of it, and I feel no urge for personal vengeance, no thirst for retribution."

"No, your dance is not vengeful," he agreed.

"But I *do* have a grievance—not as a bereaved lover but as a bereaved human being. I want those aliens to know what they cost my race when they wrought the death of Shara Drummond, when they forced her hand and made her into *Homo caelestis* before there was any place or any way for one to live—" I broke off, realizing that I had blundered, but

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DeLaTorre did not even blink.

"Was she not already *Homo caelestis,* or *ala anima,* when they arrived, Charles?" he asked as blandly as if he was supposed to know those terms. "Would she not have died on her return to Earth in any case, by that point?"

I recognized and accepted the sudden rise in our truth level, preoccupied by his question. "Perhaps, Ezequiel. Her body must have been on the borderline of permanent adaptation. I have lain awake many nights, thinking about this, talking it over with my wife. I keep thinking: had Shara visualized what her *Stardance* would do financially, she might have endured a brief wait at Skyfac, might have survived to be a more worthy leader for our studio. I keep thinking: had she thought things through, she might not have chosen to burn her wings, so high above her lost planet. I keep thinking: had she known, she might have lived."

I sucked rotten coffee from a bulb and made a face. "But all the fighting spirit had been sucked out of her, drained into the *Stardance* and hurled at those red fireflies with the last of her strength. All of her life, right up to Carrington, had been slowly draining the will to live out of her, and she threw all that she had left at those things, because that was what it took to scare them back to interstellar space, to frighten them so bad that their nearest subsequent approach was a billion klicks away. There was no will to live left after that, certainly not enough to sustain her.

"I want to convey to those creatures the value of the entity their careless footstep crushed, the enormity of her people's loss. If grief or remorse are in their emotional repertoire, I want to see some. Most of all, I think, I want to forgive them. And so I have to state my complaint *first.* I believe that their reaction will tell us quicker than anything else whether we can *ever* learn to communicate and peacefully coexist with them.

"They *respect* dance, Ezequiel, and they cost us the greatest artist of our time. A race that could open with any other statement is one I don't much want to represent. That'd be Montezuma's mistake all over again. Norrey and the others agree with me: this is a dealbreaker."

He was silent a long time. The last thing a diplomat will concede is that compromise is impossible. But at last he said, "I follow your thought, Charles. And I admit that it leads me to the same conclusion." He sighed. "You are right. I will make the others accept this." He pushed free and jaunted to me, taking both my shoulders in his wrinkled, mottled hands. "Thank you for explaining to me. Come, let us prepare to go and state our grievance."

He was closeted with the other three for a little over twenty minutes, and emerged with an extremely grudging accord. He was indeed the best man Wertheimer could have chosen. Half an hour later we were on our way.

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CHAPTER NINE

It took the better part of a day to coax *Siegfried* from Titan orbit to the Trojan point, without employing accelerations that would kill us all. Titan is a mighty moon, harder to break free of than Luna. Fortunately, we didn't want to break free of it—quite. We essentially widened the circle of our orbit until it intersected the Trojan point -decelerating like hell all the way so that we'd be at rest relative to it when we got there. It had to be at least partly by-guess-and-by-God, because any transit in Saturn's system is a ten body problem (don't even *think* about the Ring), and Bill was an equal partner with the computer in that astrogating job. He did a world class job, as I had known he would, wasting no fuel and, more important, no passengers. The worst we had to endure was about fifteen seconds at about .6 gee, mere agony.

Any properly oriented wall will do for an acceleration couch—since everything in a true spaceship is well padded (billion dollar spaceprobe designers aren't *that* unimaginative). I don't know about all the others, but Norrey and I and anybody sensible customarily underwent acceleration naked. If you've got to lie flat on your back under gravity, you don't want wrinkly clothes and bulky velcro pads between you and the padding.

When we drifted free of the wall and the "acceleration over" horn sounded, we dressed in the same p-suits we had worn on our last ride together, a year ago. Of the five models of custom-made suits we use, they are the closest to total nudity, resembling abbreviated topless bathing suits with a collared hood. The transparent sections are formfitted and scarcely noticeable; the "trunks" are not for taboo but for sanitary reasons; and the hood and collar section is mostly to conceal the unaesthetic amount of hardware that must be built into a p-suit hood. The thrusters are ornate wrist and ankle jewelry; their controls golfing gloves. The group had decided unanimously that we would use these suits for our performance. Perhaps by the overt image of naked humans in space, we were unconsciously trying to assert our humanity, to deny the concepts of ourselves as *other than human* by displaying the evidence to the contrary. See? Navel. See? Nipples. See? Toes.

"The trouble with these suits, my love," I said as I sealed my own, "is that the sight of you in yours always threatens to dislodge my catheter tube."

She grinned and made an unnecessary adjustment of her left breast. "Steady, boy. Keep your mind on business."

"Especially now that the bloody *weight* is gone. How did you women put up with it for centuries? Having some great heavy clod lie on you like that?"

"Stoically," she said, and jaunted for the phone. She diddled its controls, and said, "Linda—how's the baby?"

Linda and Tom appeared on the screen, in the midst of helping each

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other suit up. "Fine," Linda called happily. "Nary a quiver."

Tom grinned at the phone and said, "What's to worry? She still fits into her p-suit, for crying out loud."

His composure impressed and deeply pleased me. When we left Skyfac I would have predicted that at this precurtain moment, with a pregnant wife to worry about, Tom would be agitated enough to chew pieces off his shoulder blades. But free space, as I have said, is a tranquilizing environment—and more important, he had allowed Linda to teach him much. Not just the dance, and the breathing and meditational exercises for relaxation—we had all taught him these things. Not even the extensive spiritual instruction she had given that ex-businessman (which had begun with loud arguments, and calmed down when he finally got it through his head that she had no creed to attack, no brand label to discredit), though that helped of course.

Mostly it was her love and her loving that had finally unsnarled all the knots in Tom's troubled soul. Her love was so transparently genuine and heartfelt that it forced him to take it at face value, forced him therefore to love himself a little more—which is all anyone really needs to relax. Opening up to another frees you at least temporarily of all that armor you've been lugging, and your disposition invariably improves. Sometimes you decide to scrap the armor altogether.

Norrey and I glanced at each other, smiled, and then she said, "That's great, you two. See you at the garage," and cleared the screen.

She drifted round in space, lovely breasts majestic in free fall, till she was facing me. "Tom and Linda will be good partners for us," she said, and was silent.

We hung at opposite ends of the room for a few seconds, lost in each other's eyes, and then we kicked off at the same instant and met, hard, at the center of the room. Our embrace was four limbed and fierce, a spasmodic attempt to break through the boundaries of flesh and bone and plastic and touch hearts.

"I'm not scared," she said in my ear. "I ought to be scared, but I'm not. Not at all. But *oh*, I'd be scared if I were going into this without you!"

I tried to reply and could not, so I hugged tighter.

And then we left to meet the others.

Living in *Siegfried* had been rather like living belowdecks in a luxury liner. The shuttlecraft was more like living in a bus, or a plane. Rows of seats with barely enough room to maneuver above them, a *big* airlock aft, a smaller one in the forward wall, windows on either side, engines in the rear. But from the outside it would have appeared that the bus or plane had rammed a stupendous bubble. The bow of the craft was a transparent sphere about twenty meters in diameter, the observation globe from which the team of diplomats would observe our performance. There was extreme-

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ly little hardware to spoil the view. The computer itself was in *Siegfried* and the actual terminal was small; the five video monitors were little bigger, and the limousine's own guidance systems were controlled by another lobe of the same computer. There would be no bad seats.

There had inevitably, been scores of last minute messages from Earth, but not even the diplomats had paid any attention to them. Nor was there much conversation on the trip. Everyone's mind was on the coming encounter and our master plan, insofar as we could be said to have one, had been finalized long since.

We had spent a year studying computer analyses of *both* sides of the *Stardance*, and we believed we had gotten enough out of them to prechoreograph an opening statement in four movements. About an hour's worth of dance, sort of a mandarin's greeting. By the end of that time, we would either have established telepathic rapport or not. If so, we would turn the phone over to the diplomats. They would pass their consensus through Del aTorre, and we would communicate their words to the aliens as best we could. If, for some reason, consensus could not be reached, then we would dance that too. If we could *not* establish rapport, we would watch the aliens' reply to our opening statement and we and the computer would try to agree on a translation. The diplomats would then frame their reply, the computer would feed us choreographic notation, and we'd try it that way. If we got no results by the end of nine hours, two air changes, we'd call it a day, take the limo back home to *Siegfried* and try again tomorrow. If we got good or promising results, we had enough air cans to stay out for a week—and the Die was stocked with food, water and a stripped down toilet.

Mostly we all expected to play it by ear. Our ignorance was so total that anything would be a breakthrough, and we all knew it.

There was only one video screen in the passenger compartment, and Cox's face filled it throughout the short journey. He kept us posted on the aliens' status, which was static. At last deceleration ended, and we sank briefly in our seats as the limousine turned end over end to present the bubble to the aliens, and then we were just finally *there*, at the crossroads. The diplomats unstrapped and went forward to the bubble's airlock; the Stardancers went aft to the big one. The one that had the EXIT light over it.

We hung there together a moment, by unspoken consent, and looked around at each other. No one had a moving, Churchillian speech to deliver, no wisecracks or last sentiments to exchange. The last year had forged us into a *family*; we were already beginning to become mutually telepathic after a fashion. We were beyond words. We were ready.

What we did, actually, we smiled big idiotic smiles and joined hands in a snowflake around the airlock.

Then Harry and Raoul let go on

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either end, kissed each other, seated their hoods and entered the airlock to go build our set. There was room for four in the airlock; Tom and Linda squeezed in with them. They would deploy the Die and wait for us.

As the door slid closed behind them, Norrey and I shared our own final kiss.

"No words," I said, and she nodded slightly.

"Mr. Armstead," from behind me.

"Yes, Dr. Chen?"

He was half in his airlock, alone. Without facial or vocal expression he said, "Blow a gasket."

I smiled. "Thank you, sir."

And we entered the lock.

There is a kind of familiarity beyond déjà vu, a recall greater than total. It comes on like scales falling from your eyes. Say, you haven't taken LSD in a long while, but you sincerely believe that you remember what the experience was like. Then you drop again, and as it comes on you simply say, "Ah yes—reality," and smile indulgently at your foolish shadow memories. Or (if you're too young to remember acid), you discover real true love, at the moment when you are making love with your partner and realize that all of your life together is a single, continuous and ongoing act of lovemaking, in the course of which you happen to occasionally disengage bodies altogether for hours at a time. It is not something to which you *return*—it is something you suddenly find that you have never really left.

I felt it now as I saw the aliens again.

Red fireflies. Like glowing coals without the coals inside, whirling in something less substantial than a bubble, more immense than *Siegfried*. Ceaselessly whirling, in ceaselessly shifting patterns that drew the eye like the dance of the cobra.

All at once it seemed to me that the whole of my life was the moments I had spent in the presence of these beings—that the intervals between those moments, even the endless hours studying the tapes of the aliens and trying to understand them, had been unreal shadows, already fading from my memory. I had always known the aliens. I would always know them, and they me. We went back about a billion years together. Like coming home from school to mom and dad, who are unchanging and eternal. *Hey*, I wanted to tell him, *I've stopped believing I'm a cripple,* as a kid might proudly announce that he's passed a difficult chem test . . .

I shook my head savagely, and snapped out of it. Looking away helped. Everything about the setting said that something more than confused dreams had occurred since our last meeting. Just past the aliens, mighty Saturn shown yellow and brown, ringed with coruscating fire. The Sun behind my back provided only one percent of the illumination it shone on Terra—but the difference was not discernible: the terrestrial eye habitually filters out ninety-nine percent of available light. (It suddenly struck me, the coinci-

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dence that this meeting place the aliens had chosen happened to be precisely as far away from the Sun as a human eye could go and still see properly.

We were "above" the Ring. It defied description.

To my "right," Titan was smaller than Luna (under a third of a degree), but clearly visible, nearly three-quarters full from our perspective. Where the terminator faced Saturn the dull red color softened to the hue of a blood orange, from the reflected Saturnlight. The great moon still looked smoky, like a baleful eye on our proceedings.

And all around me, my teammates were floating, staring, hypnotized.

Only Tom was showing signs of self possession. Like me, he was renewing an old acquaintance; reaffirming strong memories takes less time than making new ones.

We knew them better, this time, even those who were facing them for the first time. At that last confrontation, only Shara had seemed able to understand them to any degree—no matter how hard I had watched them, then, understanding had eluded me. Now my mind was free of terror, my eyes unblinded by need, my heart at peace. I felt as Shara had felt, saw what she had seen, and agreed with her tentative evaluations.

There's a flavor of arrogance to them. Conviction of superiority. Their dance is a challenging, a dare.

biologists studying the antics of a strange, new species . . ."

"*They want Earth.*"

". . . *in orbits as carefully choreographed as those of electrons . . .*"

"*Believe me, they can dodge or withstand anything you or Earth can throw at them. I* know."

Cox's voice broke through our reverie. "*Siegfried* to Stardancers. They're the same ones, all right: the signatures match to three nines."

We had planned for the possibility that these might have been a *different* group of aliens—say, policemen looking for the others, or possibly even the second batch of suckers to buy a Sol-System Tour on the strength of the brochure. Even low probabilities had been prepared for. As Bill spoke, he, the diplomats, and the computer flushed several sheafs of contingency scenarios from their memory banks and confirmed Plan A in their minds.

But *all* of us Stardancers had known already, on sight.

"Roger, *Siegfried*," I acknowledged. "I'm terrible on names, but I never forget a face. 'That's the man, officer.'"

"Initiate your program."

"All right, let's get set up. Harry, Raoul, deploy the set and monitor. Tom and Linda, deploy the Die—about twenty klicks thataway, okay? Norrey, give me a hand with camera placement, we'll all meet at the Die in twenty minutes. Go."

The set was minimal, mostly positional grid markers. Raoul had not taken long to decide that attempting

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flashy effects in the close vicinity of the Ring would be vain folly. His bank of tracking lasers were low power, meant only as gobos to color light us dancers vividly for the camera—and to see how the aliens would react to the presence of lasers, which was their real purpose. I thought it was a damned fool stupid idea—like the Pope picking his teeth with a stiletto as he comes to dicker with Attila—and the whole company, Raoul included, agreed wholeheartedly. We all wanted to stick to conventional lights.

But if you're going to win arguments with diplomats of that stature you've got to make some concessions.

The grid markers were color organs slaved to Raoul's Musicmaster through a system Harry designed. If the aliens responded noticeably to color cues, Raoul would attempt to use his instrument to make visual music, augmenting our communication by making the spectrum dance with us. Just as the sonic range of the Musicmaster exceeded the audible on both ends, the spectral range of the color organs exceeded the visible. If the aliens' language included these subtleties, we would have rich converse indeed. Even the ship's computer might have to stretch itself.

The Musicmaster's audio output would be in circuit with our radios, well below conversational level. We wanted to enhance the possibility of a kind of mutual telepathic resonance, and we were conditioned to Raoul's music that way.

Norrey and I set up five cameras in an open cone facing the aliens, for a proscenium stage effect, as opposed to the six camera globe we customarily used at home for 360° coverage. Neither of us felt like traveling around "behind" the aliens to plant the last camera there. This would be the only dance we had ever done that would be shot from every angle *except* the one toward which it was aimed, recorded only "from backstage," as it were.

To tell you the truth, it didn't make that much difference. Artistically, it wasn't much of a dance. I wouldn't have released it commercially. It's obvious, really: it was never intended for humans.

That had been the real root of our struggle with the diplomats over the last year. They were committed to the belief that what would be understood best by the aliens was precise adherence to a series of computer generated *movements*. We Stardancers unanimously believed that what the aliens had responded to in Shara had been *not* a series of movements but *art*. The artistic mind behind the movements, the amount of heart and soul that went into them—the very thing an over rigid choreography destroys in space. If we accepted the diplomats' belief structure, we were only computer display models. If they had accepted our belief structure, Dmirov and Silverman at least would have been forced to admit themselves forever deaf to alien speech—and Chen would never have been able to justify siding with us to his superiors.

The result was, of course, compro-

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mise that satisfied no one, with provisions to dump whichever scheme didn't seem to be working, *if* consensus could be reached. That was another reason I had had to gamble our lives and our race's fortune on the damned lasers in order to win control of the first movement. The balance would be biased slightly our way: our very first "utterances" would be something more than could be expressed mathematically and ballistically.

But even if we had had a totally free hand, our dance would surely have puzzled hell out of anyone but another *Homo caelestis*.

I think Shara would have loved it.

At last all the pieces were in place, the stage was set, and we formed a snowflake around the Die.

"Watch your breathing, Charlie," Norrey warned.

"Right you are, my love." My lungs were taking orders from my hindbrain: it seemed to want me agitated. But I didn't. I began forcing measure on my breaths, and soon we were all breathing in unison, in, hold, out, hold, striving to push the interval past five seconds. My agitation began to melt like summer wages, my peripheral vision expanded spherically, and I felt my family as though a literal charge of electricity passed from hand to p-suited hand, completing a circuit that *tuned* us to one another. We became like magnets joined around a monopole, aligned to an imaginary point at the center of our circle. It was an encouraging analogy—however you disperse such magnets in free fall, eventually they will come together again at the pole. We were family; we were one. Not just our shared membership in a hypothetical new genus: we knew each other backstage, a relationship like no other on Earth or off it.

"Mr. Armstead," Silverman growled in stereo, "I'm sure you'll be glad to know that for once the world actually *is* waiting for you. Can we get on with the show?"

I just smiled. We all smiled. Bill started to say something, so I cut him off. "Certainly, Mr. Ambassador. At once." We dissolved the snowflake, and I jetted to the Die's external master board. "Program locked and . . . *running*, lights *up*, cameras *hot*, hold four three two *curtain!*"

Like a single being, we took our stage.

Feet first, hands high and blasting, we plunged down on the firefly swarm.

Raoul's stage marks pulsed gently with the color analog of the incredible piece he called *Shara's Blues*. Its opening bars are entirely in deep bass register; they translated as all the shades of blue there are, a visual pun. Somehow the incredible splendor of color about us—Saturn, Ring, aliens, Titan, lasers, camera lights, Die, limousine like a soft red flashlight, and two other moons I didn't know—all only seemed to emphasize the intolerable blackness of the empty space that framed it, the immensity of the sea of

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black ink through which we all swam, plants and people alike. The literally cosmic perspective it provided was welcome, calming. *What are man or firefly that Thou shouldst be mindful of them?*

It was not detachment. Quite the opposite: I had never before felt so alive. For the first time in years I was aware of my p-suit clinging to my skin, aware of the breathing in my earphones, aware of the smell of my own body and of canned air, aware of the catheter and telemetry contacts and the faint sound of my hair rustling against the inside of my hood. I was perceiving totally, functioning at full capacity, exhilarated and a little scared. I was completely happy.

The music swelled suddenly. The far flung grid pulsed with color.

We poured on full thrust, all four of us in a tight formation, so that we seemed to fall upon the alien swarm from a great height. They grew beneath our feet with breathtaking rapidity, but we were more than three klicks away when I gave the standby command. We stiffened our bodies, oriented and triggered heel thrusters together on command, opening out like a Blue Angels flower into four great loops. We let them close into circles, one of us spiraling about each of the "compass points" of the alien sphere, bracketing them with bodies. After three full circles we broke out in unison and met at the same point where we had split apart, slowing as we arrived and making a four-way acrobat's catch. Hard jetting brought us to a halt; we whirled in space and faced the aliens; pinwheeled apart into a square fifty meters on a side and waited.

Here I am again, fireflies, I thought. *I have hated you for a long time. I would be done with hating you, however that may be.*

Lasers turned us red, blue, yellow, and aching green, and Raoul had abandoned known music for new; his spiderlike fingers wove patterns undreamed an hour before, stitching space with color and our ears with sound. Melancholy his melody, minor its wrestling two chords, with a throbbing undercurrent of dysharmonic bass like a migraine about to happen. It was as though he were pouring pain into a vessel, whose cubic capacity might be inadequate.

With that for frame and all space for backdrop, we danced. The mechanical structure of that dance, the "steps" and their interrelation, are forever unknowable to you, and I won't try to describe them. It began slowly, tentatively: as Shara had, we began by defining terms. And so we ourselves gave the choreography less than half our attention.

Perhaps a third. A part of our minds was busy framing computer themes in artistic terms, but an equally large part was straining for any signs of feedback from the aliens, reaching out with eyes, ears, skin, mind for any kind of response, sensitizing to any conceivable touch. And with as large a part of our minds, we felt for each other, strove to connect our awareness

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across meters of black vacuum, to see as the aliens saw, through many eyes at once.

And something began to happen to us.

It began slowly, subtly, in imperceptible stages. After all the year of study, I simply found myself understanding, and accepting the understanding without surprise or wonder. At first I thought they had slowed their speed—but then I noted, again without wonder, that my pulse and everyone's respiration had slowed an equal amount. I was on accelerated time, extracting the maximum of information from each second of life, *being* with the whole of my being. Experimentally I accelerated my time sense another increment, saw the aliens' frenzy slow to a speed that anyone could encompass. I was aware that I could make time stop altogether, but I didn't want to yet. I studied them at infinite leisure, and understanding grew. It was clear now that there was a tangible if invisible energy that held them in their tight mutual orbits, as electromagnetism holds electrons on their paths. But this energy boiled furiously at their will, and they surfed its currents like wood chips that magically never collided. They created a never ending roller coaster before themselves. Slowly, slowly I began to realize that this energy was *more than* analogous to the energy that bound me to my family. What they were surfing on was their mutual awareness of each other, and of the universe around them.

My own awareness of my family jumped a quantum level. I heard Norrey breathing, could see out her eyes, felt Tom's sprained calf tug at me, felt Linda's baby stir in my womb, watched us all and swore under Harry's breath with him, raced down Raoul's arm to his fingers and back into my own ears. I was a six-brained snowflake, existing simultaneously in space and time and thought and music and dance and color and something I could not yet name, and all of these things strove toward harmony.

At no point was there any sensation of leaving or losing my *self*, my unique individual identity. It was right there in my body and brain where I had left it, could not be elsewhere, existed as before. It was as though a part of it had always existed as before. It was as though a part of it had always existed independent of brain and body, as though my brain had always known this level but had been unable to *record* the information. Had we six been this close all along, all unawares, like six lonely blind men in the same volume of space? In a way I had always yearned to without knowing it, I touched my selves, and loved them.

We understood entirely that we were being shown this level by the aliens, that they had led us patiently up invisible psychic stairs to this new plane. If any energy detectable by man had passed between them and us, Bill Cox would have been heating up his laser cannon and screaming for a report, but he was still on conference circuit with the diplomats, letting us

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dance without distraction.

But communication took place, on levels that even physical instruments could perceive. At first the aliens only echoed portions of our dance, to indicate an emotional or informational connotation they understood, and when they did so we *knew* without question that they had fully grasped whatever nuance we were trying to express. After a time they began more complex responses, began subtly altering the patterns they returned to us, offering variations on a theme, then counterstatements, alternate suggestions. Each time they did so we came to know them better, to grasp the rudiments of their "language" and hence their nature. They agreed with our concept of sphericity, politely disagreed with our concept of mortality, strongly agreed with the notions of pain and joy. When we knew enough "words" to construct a "sentence," we did so.

We came these billion kilometers to shame you, and are ashamed.

The response was at once compassionate and merry. *NONSENSE,* they might have said, *HOW WERE YOU TO KNOW?*

Surely it was obvious that you were wiser than we.

NO, ONLY THAT WE KNEW MORE. IN POINT OF FACT, WE WERE CULPABLY CLUMSY AND OVEREAGER.

Overeager? we echoed interrogatively.

OUR NEED WAS GREAT. All fifty-four aliens suddenly plummeted toward the center of their sphere at varying rates, incredibly failing to collide there even once, saying as plain as day, *ONLY RANDOM CHANCE PREVENTED UTTER RUIN.*

The nature of the utter ruin eluded us, and we "said" as much. *Our dead sister told us you needed to spawn, on a world like ours. Is this your wish: to come and live with humans?*

Their response was the equivalent of cosmic laughter. It resolved finally into a single, unmistakable, "sentence": *ON THE CONTRARY.*

Our dance dissolved into confusion for a moment, then recovered. *We do not understand.*

The aliens hesitated. Something like solicitude emanated from them, something like compassion. *WE CAN—WE MUST—EXPLAIN. BUT UNDERSTANDING WILL BE VERY STRESSFUL. COMPOSE YOURSELVES.*

The component of our self that was Linda poured out a flood of maternal warmth, an envelope of calm; she had always been the best of us at prayer. Raoul now played only an *om*like A flat that was a warm golden color. Tom's driving will, Harry's eternal acceptance, Norrey's quiet strength, my own unfailing sense of humor, Linda's infinite caring and Raoul's dogged persistence all heterodyned to produce a kind of peace I had never known, a serene calm based on a sensation of completeness. All fear was gone, all doubt. This was meant to be.

This was meant to be, we danced. *Let it be.*

The echo was instantaneous, with a

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flavor of pleased, almost paternal approval.

Now.

Their next sending was a relatively short dance, a relatively simple dance. We understood it at once, although it was utterly novel to us, grasped its fullest implications in a single frozen instant. The dance compressed every nanosecond of more than two billion years into a single concept, a single telepathic *gestalt*.

And that concept was really only the aliens' name.

Terror smashed the snowflake into six discrete shards. I was alone in my skull in empty space, with a thin film of plastic between me and my death, naked and terribly afraid. I clutched wildly for nonexistent support. Before me, much too close before me, the aliens buzzed like bees. As I watched, they began to gather at the center, forming first a pinhole, then a knothole and then a porthole in the wall of hell. A single shimmering red coal that raved with furious energy. Its brilliance dwarfed even the Sun; my hood began to polarize.

The barely visible balloon that contained the molten nucleus began to weep red smoke, which spiraled gracefully out to form a kind of Ring. I knew it at once, what it was and what it was for, and I threw back my head and screamed, triggering all thrusters in blind escape reflex. Five screams echoed mine. I fainted.

CHAPTER TEN

I was lying on my back with my knees raised, and I was much too heavy—almost twenty kilos. My ribs were struggling to inflate my chest. I had had a bad dream . . .

The voices came from above like an old tube amp warming up; intermittent and distorted at first, resolving at last into a kind of clarity. They were near, but they had the trebleless, far away characteristic of low pressure—and they too were finding the pseudogravity a strain.

"For the last time, tovarisch: *speak to us.* Why are your colleagues all catatonic? How do you continue to function? *What in Lenin's name happened out there?*"

"Let him be, Ludmilla. He cannot hear you."

"I will have an answer!"

"Will you have him shot? If so, by whom? The man is a hero. If you continue to harass him, I will make full note of it, in our group report and in my own. *Let him be.*" Chen Ten Li's voice was quite composed, exquisitely detached until that last blazing command. It startled me into opening my eyes, which I had been avoiding since I became aware of the voices.

We were in the limousine. All ten of us, four Space Command suits and six brightly colored Stardancers, a quorum of bowling pins strapped by twos into a vertical alley. Norrey and I were in the last or bottom row. We were obviously returning to *Siegfried* at full burn, making a good quarter gee. I turned my head at once to Norrey beside me. She seemed to be sleeping peacefully; the stars through the win-

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dow behind her told me that we had already passed turnover and were decelerating.

I had been out a long time.

Somehow everything had gotten sorted out in my sleep. By definition, I guess: my subconscious had kept me under until I was ready to cope. A part of my mind boiled in turmoil, but I could encompass that part now and hold it in perspective. The majority of my mind was calm. Nearly all questions were answered now, and the fear dwindled to something that could be borne. I knew for certain that Norrey was all right, that all of us would be all right in time. Not direct knowledge; the telepathic bond was broken. But I knew my family. Our lives were irrevocably changed, into what we knew not yet—but we would find out together.

At least two more crises would come in rapid succession now, and we would share these fortunes.

Immediate needs first.

"Harry," I called out, "you did a good job. Let go now."

He turned his big crewcut head and looked down past his headrest at me from two rows up. He smiled beatifically. "I almost lost his music box," he said confidentially. "It got away from me when the weight came on." At once he rolled his head up and was asleep, snoring deeply.

I smiled indulgently at myself. I should have expected it, should have known that it would be Harry, great-shouldered, great-hearted Harry who would be the strongest of us all, Harry the construction engineer who would prove to have infinite load bearing capacity. His shoulders had been equal to his heart's need, and his breaking strain was still unknown. He would waken in an hour or so like a giant refreshed.

The diplomats had been yelping at me since I spoke to Harry; now I put my attention on them. "One at a time, please."

By God, not one of the four would yield. Knowing it was foolish, they all kept talking at once. They simply couldn't help themselves."SHUT UP!" Bill's voice blasted from the phone speaker, overriding the cacophony. They shut up and turned to look at his image. "Charlie," he went on urgently, searching my face in his own screen, "*are you still human?*"

I knew what he was asking. Had the aliens somehow taken me over telepathically? Was I still my own master, or did an aggressive hive-mind live in my skull, working my switches and pulleys? We had discussed the possibility earnestly on the trip out, and I knew that if my answer didn't convince him he would blast us out of space without hesitation. The least of his firepower would vaporize the limousine instantly.

I grinned. "Only for the last two or three years, Bill. Before that I was semipure bastard."

Later he would be relieved; he was *busy*. "Do I burn them?"

"*Negative.* Hold your fire! Bill, hear me good: if you shot them, and they ever found out about it, they

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might just take offense. I know you've got a planet cracker; forget it: *from here they can turn out the Sun.*"

He went pale, and the diplomats held shocked silence, turning with effort to gape at me. "We're nearly home," I went on firmly. "Conference in the exercise room as soon as we're all recovered, call it a couple of hours from now. All hands. We'll answer all your questions then—but until then my best advice is to smoke a joint and meditate. We've had a hell of a shock; we need time to recover." Norrey was beginning to stir beside me, and Linda was looking about clear-eyed; Tom was shaking his head with great care from side to side. "Now I've got my wife and a pregnant lady to worry about. Get us home and get us to our rooms, and we'll see you in two hours."

Bill didn't like it a little bit, but he cleared the screen and got us home. The diplomats, even Dmirov and Silverman, were silent, a little in awe of us.

By the time we were docked everyone had recovered except Harry and Raoul, who slumbered on together. We towed them to their room, washed them gently, strapped them into their hammock so they wouldn't drift against the air grille and drown in carbon dioxide, and dimmed the lights. They held each other automatically in their sleep, breathing to the same rhythm. We left Raoul's Musicmaster by the door, in case he might ever want it for something, and swam out.

Then the four of us went back to our respective rooms, showered, and made love for two hours.

The exercise room was the only one in *Siegfried* with enough cubic to comfortably contain the entire ship's complement. We could all have squeezed into the dining room; we often did for dinner. But it was cramped, and I did not want close quarters. The exercise room was a cube perhaps thirty meters on a side. One wall was studded with various rigs and harnesses for whole-body workout in free fall. Retaining racks on another held duckpins, frisbees, hula hoops, and handballs. Two opposing walls were trampolines. It offered elbow room, visibility, and marvelous maneuverability.

And it was the only room in the ship arranged with no particular local vertical.

The diplomats, of course, arbitrarily selected one, taping velcro strips to the bare handball wall so that the opposed trampolines were their "ceiling" and "floor." We Stardancers aligned ourselves against the far wall, among the exercise rigs, holding on to them with a hand or foot rather than velcroing ourselves to the wall between them. Bill and Colonel Song took the wall to our left.

"Let's begin," I said as soon as we had all settled ourselves.

"First, Mr. Armstead," Silverman said aggrievedly, "I would like to protest the high-handed manner in which you have withheld information from

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this body to suit your convenience."

"Sheldon," DeLaTorre began wearily.

"No sir," Silverman cut him off, "I vigorously protest. Are we children, to be kept twiddling our thumbs for two hours? Are all the people of Earth insignificant, that they should wait in suspense for three and a quarter hours while these—*artists* have an orgy?"

"Sounds like you've been twiddling volume controls," Tom said cheerily. "You know, Silverman, I knew you were listening the whole time. I didn't mind. I knew how much it must be bugging you."

His face turned bright red, unusual in free fall; his feet must be just as red.

"No," Linda said judiciously, "I rather think he was monitoring Raoul and Harry's room."

He went paler than he had started and his pupils contracted with hatred. Bullseye.

"All right, can it," Bill rapped. "You too, Mr. Ambassador. Snipe on your own time—as you say, all Terra is waiting."

"Yes, Sheldon," DeLaTorre said forcefully. "Let Mr. Armstead speak."

He nodded, white lipped. "So speak."

I relaxed my grip on an exercise bike and spread my arms. "First tell me what happened from your perspective. What did you see and hear?"

Chen took it, his features masklike, almost waxen. "You began your dance. The music became progressively stranger. Your dance began to deviate radically from the computer pattern, and you were apparently answered with other patterns of which the computer could make nothing. The speed of your movements increased drastically with time, to a rate I would not have believed if I had not witnessed it with my unaided eyes. The music increased in tempo accordingly. There were muffled grunts, exclamations, nothing intelligible. The aliens united to form a single entity in the center of their envelope, which began to emit quantities of what we are told is organic matter. You all screamed.

"We tried to raise you without success. Mr. Stein would not answer our calls, but he retrieved all five of you with extreme efficiency, lashed you together, and towed you all back to the shuttlecraft in one trip."

I pictured the load that five of us, massing over three hundred kilos, must have been when the thrust came on, and acquired new respect for Harry's arms and shoulders. Brute muscle was usually so superfluous in space—but another man's muscles might have parted under that terrible strain.

"As soon as the airlock had cycled he brought you all inboard, strapped you in place, and said the single word, 'Go.' Then he very carefully stowed Mr. Brindle's musical instrument and—just sat down and stared at nothing. We were abandoning the task of communicating with him when you awoke."

"Okay," I said. "Let me cover the

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high spots. First, as you must have guessed, we achieved rapport with the aliens."

"And are they a threat to us?" Dmirov interrupted. "Did they harm you?"

"No. And no."

"But you screamed, like ones sure to die. And Ms. Drummond clearly stated before she died—"

"That the aliens were aggressive and arrogant, that they wanted Earth for a spawning ground, I know," I agreed. "Translation error, subtle and in retrospect almost inevitable. Shara had only been in space a few months; she said herself she was getting about one concept in three."

"What is the correct translation?" Chen asked.

"Earth *is* their spawning ground," I said. "So is Titan. So are a lot of places, outside this system."

"What do you mean?" Silverman barked.

"The aliens' last sending was what kicked us over the deep end. It was stunningly simple, really, considering how much it explained. You could render it as a single word. All they did was tell us their collective name."

Dmirov scowled. "And that is?"

"Starseeder."

Stunned silence at first. I think Chen was the first to begin to grasp it, and maybe Bill was nearly as fast.

"That's their name," I went on, "their occupation, the thing they do to be fulfilled. They farm stars. Their lifetime spans billions of years, and they spend them much as we do, trying to reproduce a good part of the time. They seed stars with organic life. They seeded *this* solar system, a long time ago.

"They are our race's creator, and its remotest ancestor."

"Ridiculous," Silverman burst out. "They're nothing like us, *in no way* are they like us."

"In how many ways are you like an amoeba?" I asked. "Or a paramecium or a plant or a fish or an amphibian or any of your evolutionary forebears? The aliens are at least one or two and possibly three evolutionary stages beyond us. The wonder is that they can make themselves understood to us at all: I believe the next level beyond them has no physical existence in space or time."

Silverman shut up. DeLaTorre and Song crossed themselves. Chen's eyes were very wide.

"Picture the planet Earth as a single, stupendous womb," I went on quietly, "fecund and perpetually pregnant. Ideally designed to host a maximum of organic life, commanded by a kind of super-DNA to constantly grow and shuffle progressively more complex life forms into literally billions of different combinations, in search of one complex enough to survive outside the womb, curious enough to try.

"I nearly had a brother once. He was born dead. He was three weeks past term by then: he had stayed in the womb past his birthing time, by God knows what subtle biological error.

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His waste products exceeded the ability of the placenta to absorb and carry away; it began to die, to decay around him, polluted by his own wastes. His life support eroded away and he died. He very nearly killed my mother.

"Picture your race as a gestalt, a single organism with a subtle flaw in its genetic coding. An overstrong cell wall, so that at the moment when it is complex enough that it ought to have a united planetary consciousness, each separate cell continues to function most often as an individual. The thick cell wall impedes information exchange, allows the organism to form only the most rudimentary approximation of a central nervous system, a network that transmits only aches and pains and shared nightmares. The news and entertainment media.

"The organism is not hopelessly deformed. It trembles on the verge of birthing, yearns to live even as it feels itself dying. It may yet succeed. On the verge of extinction, man gropes for the stars, and now less than a century after the first man left the surface of Earth in powered flight, we gather here in the orbit of Saturn to decide whether our race's destiny should now be extended or cut short.

"Our womb is nearly filled with our poisonous by-products. The question before us is: are we or are we not going to outgrow our neurotic dependence on planets—before it destroys us?"

"What is this crap," Silverman snarled, "some more of your *Homo caelestis* horseshit? Is that your next evolutionary step? McGillicuddy was right, it's a goddam evolutionary *dead end*! You couldn't be self supporting in fifty years from a standing start, the speed you recruit. If the Earth and Moon blew up tomorrow, God forbid, you would be dead within two or three years at the outside. You're parasites on your evolutionary inferiors, Armstead, exiled parasites at that. You can't live in your new environment without cell walls of steel and slashproof plastic, essential artifacts that are manufactured *only back there in the womb.*"

"I was wrong," Tom said softly. "We're not an evolutionary dead end. I couldn't see the whole picture."

"*What did you miss?*" Silverman screamed.

"We have to change the analogy now," Linda spoke up. "It starts to break down." Her warm contralto was measured and soothing; I saw Silverman begin to relax as the magic worked on him. "Think of us now not as sextuplets, or even as a kind of six-personed fetus. Think of the Earth not as a uterus but as an ovary—and the six of us as a single ovum. Together we carry *half* of the genes for a new kind of being.

"The most awesome and miraculous moment of all creation is the instant of syngamy, the instant at which two things come together to form so infinitely much more than the sum, or even the product of their parts: the moment of conception. That is the crossroads, with phylogeny behind and ontogeny ahead, and that is the crossroads at which we are poised now."

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"What is the sperm cell for your ovum?" Chen asked. "The alien swarm, I presume?"

"Oh no," Norrey said. "They're something more like the yin/yang, male/female overmind that produces the syngamy, in response to needs of its own. Change the analogy again: think of them as the bees they so resemble, the pollinators of a gigantic monoclinous flower we call the solar system. It is a true hermaphrodite, containing both pistil and stamen within itself. Call Earth the pistil, if you will, and we Stardancers are its combined ovule and stigma."

"And the stamen?" Chen insisted. "The pollen?"

"The stamen is Titan," Norrey said simply. "That red organic matter the aliens' balloon gave off was some of its pollen."

Another stunned silence.

"Can you explain its nature to us?" DeLaTorre asked at last. "I confess my incomprehension."

Raoul spoke now, tugging his glasses out from the bridge of his nose and letting the elastic pull them back. "The stuff is essentially a kind of superplant itself. The aliens have been growing it in Titan's upper atmosphere for millennia, staining the planetoid red. Upon contact with a human body, a kind of mutual interaction takes place that can't be described. Energy from another . . . from another plane infuses both sides. Syngamy takes place, and perfect metabolism begins." "*Perfect* metabolism?" DeLaTorre echoed uncertainly.

"The substance is a perfect symbiotic complement to the human organism."

"But—but . . . but *how*—?"

"You wear it like a second skin, and you live naked in space," he said flatly. "It enters the body at mouth and nostrils, spreads a million microtendrils throughout the system. It covers you inside and out, becomes a part of you, in total metabolic balance."

Chen Ten Li looked poleaxed. "A *perfect* symbiote . . ." he breathed.

"Right down to the trace elements," Raoul agreed. "Planned that way a billion years ago. It is our other half."

"How is it done?" he whispered.

"You enter a cloud of the stuff and open your hood. The escaping air is their chemical cue: they home in, swim upstream and spawn. From the moment they first contact bare flesh until the point of total absorption and adsorption, complete synthesis, is maybe three seconds. About a second and a half in, you cease being human, forever." He shivered. "Do you understand why we screamed?"

"No," Silverman cried. "No, I do *not*. None of this makes sense! So the red crap is a living spacesuit, a biologically tailored what you said, you give it carbon dioxide it gives you oxygen, you give it shit it gives you strawberry jam. Very lovely: you've just eliminated all your overhead except for fuel and leisure aids. Very nice fellows, these aliens. How does it make you inhuman? Does the crap take over

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your mind or what?"

"It has no 'mind' of its own," Raoul told him. "Oh, it's remarkably sophisticated for a plant, with awareness above the vegetable. There are some remarkably complex tropisms, but you couldn't call it sentient. It sort of sets up partnership with the medulla, and rarely gets even as preconscious as a reflex. It just performs its function, in accordance with its biological programming."

"What makes you inhuman then?"

My voice sounded funny, even to me. "You don't understand," I said. "You don't *know*. We would never die, Silverman. We would never again hunger or thirst, never need a place to dispose of our wastes. We would never again fear heat or cold, never fear vacuum, Silverman: we would never fear anything again. We would acquire instant and complete control of our autonomic nervous systems, gain access to the sensorium keyboard of the hypothalamus itself. We would attain telepathic communion, become a single mind in six immortal bodies, endlessly dreaming and never asleep. Individually and together we would become no more like a human than a human is like a chimpanzee. I don't mind telling you that all six of us used our diapers out there. I'm still a little scared."

"But you are ready . . ." Chen said softly.

"Not yet," Linda said for all of us. "But we will be soon. That much we know."

"This telepathy business," Silverman said tentatively. "This 'single mind' stuff—is that for sure?"

"Oh, it's not dependent on the aliens," Linda assured him. "They showed us how to find that plane—but the capacity was always there, in every human that ever lived. Every holy man that ever got enlightened came down off the mountain saying, 'We're all one'—and every damn time the people decided it must be a metaphor. The symbiote helps us *some*, but—"

"How does it help?" Silverman interrupted.

"Well, the distraction factor, mostly. I mean, most people have flashes of telepathic ability, but there are so many *distractions*. It's worse for a planet dweller, of course, but even in the studio we got hungry, we got thirsty and horny and bored and tired and sore and angry and afraid. 'Being in our heads,' we called it. The animal part of us impeding the progress of the angel. The symbiote frees you from all animal needs—you can experience them, at whim, but never again are you subject to their arbitrary command. The symbiote does act as a kind of mild amplifier of the telepathic 'wave band,' but it helps much more by improving the 'signal-to-noise ratio' at the point of origin."

"What I mean," Silverman said, "if God forbid *I* were to let this fungus infest me, *I* would become at least mildly telepathic? As well as immortal and beyond having to go to the bathroom?"

"No sir," she said politely but firmly. "If you were *already* mildly tele-

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pathic before you entered symbiotic partnership, you would become significantly more so. If, at that time, you happened to be in the field of a fully functioning telepath, you would become expotentially more so."

"But if I took, say, the average man in the street and put him in a symbiote suit—"

"—you'd get an average immortal who never needed to go to the bathroom and was more empathic than he used to be," I finished.

"Empathy is sort of telepathy's kid brother," Linda interjected.

"More like its larval stage," I corrected.

"But two average guys in symbiote suits wouldn't necessarily be able to read each other's minds?"

"Not unless they worked long and hard at learning how that's done," I told him, "which they would almost certainly do. It's *lonely* in space."

He fell silent, and there was a pause while the rest of them sorted out their opinions and emotions. It took a while.

I had things to sort out myself. I was still possessed of that same internal *certainty* that I had felt since I woke up in the limousine, feeling that almost prescient sense of inevitability, but the cusp was approaching quickly now. *What if you should die, at this moment of moments*? whispered an animal voice from the back of my skull.

As I had at the moment I confronted the aliens, I felt totally alive.

"Mr. Armstead," DeLaTorre said, shaking his head and frowning mightily, "it seems to me that you are saying that all human want is coming to an end?"

"Oh no," I said hastily. "I'm very sorry if we accidentally implied that. The symbiote cannot live in a terrestrial environment. Anything like that kind of gravity and atmosphere would kill it. No, the symbiote will not bring heaven to Earth. *Nothing* can. Mohammed must go to the mountain—and many will refuse."

"Perhaps," Chen suggested delicately, "terrestrial scientists might be able to genetically modify the aliens' gift?"

"No," Harry said flatly. "There is no *way* you can give symphonies and sunsets to a fetus that insists on staying in the womb. That cloud of symbiote over Titan is every person's birthright—but first they gotta earn it, by consenting to be born."

"And to do that," Raoul agreed, "he has to cut loose of Earth forever."

"There is an appealing symmetry to the concept," Chen said thoughtfully.

"Hell yes," Raoul said. "We should have expected something like it. The whole business of adaptation to free fall being possible but irreversible . . . look, at the moment of your birth, a very heavy miracle happened, in a single instant. One minute you were essentially a fish, with a fish's two valved circulatory system, parasitic on the womb. Then, all at once, a valve slammed shut. Zippo-bang, you were a mammal, just like that. Four

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valved heart, self-contained—*you made a major, irreversible physiological leap, into a new plane of evolution.* It was accompanied by pain, trauma, and a flood of data from senses you hadn't known you possessed. Nearly at once a whole bunch of infinitely more advanced beings in the same predicament began trying to teach you how to communicate. 'Appealing'? The symmetry is fucking overwhelming! *Now* do you begin to understand why we screamed? We're in the very midst of the same process—and all babies scream."

"I don't understand," Dmirov complained. "You can live naked in space—but how can you *go* anywhere?"

"Light pressure?" Chen suggested.

"The symbiote can deploy itself as a light sail," I agreed, "but there are other forces we will use to carry us where we want to go."

"Gravity gradients?"

"No. Nothing you could detect or measure."

"Preposterous," Dmirov snorted.

"How did the aliens get here?" I asked gently, and she reddened.

"The thing that makes it so difficult for me to credit your story," Chen said, "is the improbability factor. So much of your coming here was random chance."

"Dr. Chen," I cut him off, "are you familiar with the proverb that says there's a destiny which shapes our ends, rough-hew them how we will?"

"But any of a thousand things might have conspired to prevent any of this from occurring."

"Fifty-four things conspired to make it all occur. Superthings. Or did you think that the aliens just happened to appear in this system at the time that Shara Drummond began working at Skyfac? That they just happened to jump to Saturn when she returned to Skyfac to dance? That they just happened to appear outside Skyfac at the moment Shara was about to return to Earth forever, a failure? Or that this whole trip to Saturn just happened to be feasible in the first place? Me, I wonder what they were doing out Neptune way, that first time they appeared." I considered it. "I'll have to go see."

"You don't understand," Chen said urgently, and then controlled himself. "It is not generally known, but six years ago our planet was nearly destroyed by nuclear holocaust. Chance and good fortune saved us—there were no aliens in our skies then."

Harry spoke up. "Know what a pregnant rabbit does if conditions aren't favorable for birth? Reabsorbs the fetuses into the womb. Just reverses the process, recycles the ingredients and tries again when conditions are better."

"I don't follow."

"Have you ever heard of Atlantis?"

Chen's face went the color of meerschaum, and everyone else gaped or gasped.

"It comes in cycles," I said, "like labor pains building to a peak. They come as close together as four or five

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thousand years—the Pyramids were built that far back—and as far apart as twenty thousand."

"Sometimes they get pretty rough," Harry added. "There used to be a planet between Mars and Jupiter."

"*Bojemoi*," Dmirov breathed. "The Asteroid Belt . . ."

"And Venus is handy in case *we* screw up altogether," I agreed, "reducing atmosphere all ready to go, just seed with algae and wait. *God*, they must be patient."

Another extensive stunned silence. They believed now, all of them, or were beginning to. Therefore they had to rearrange literally everything they had ever known, recast all of existence in the light of this new information and try to determine just who, in relation to this confusion, they themselves might be. They were advanced in years for this kind of uprooting, their beliefs and opinions deeply ingrained by this time; that they were able to accept the information and think at all said clearly that every one of them possessed a strong and flexible mind. Wertheimer had chosen well: none of them cracked, rejected the truth and went catatonic as we had. Of course, they were not out in free space, thinking seriously of removing their p-suits. But then, they had pressures *we* lacked: they represented a planet.

"Your intention, then," Silverman said slowly, "is to do this thing?"

Six voices chorused, "Yes." "At once," I added.

"And you are sure that all you have told us is true, that the aliens have told no lies, held out nothing?" Ever so casually, he had been separating himself from the other diplomats.

"We're certain," I said, tensing my thighs again.

"But where will you go?" DeLaTorre cried. "What will you *do*?"

"What all newborns do. We'll examine our nursery. The solar system."

Silverman kicked off suddenly, jaunting to the empty fourth wall. "I'm very sorry," he said mournfully. "You'll do nothing of the kind."

There was a small Baretta in his hand.

CHAPTER ELEVEN

There was a calculator in his other hand. At least, it looked like one. All at once I knew better, and feared it more than the gun.

"This," he said, confirming my guess, "is a short range transmitter. If anyone approaches me suddenly, I will use it to trigger radio controlled explosives, which I placed during the trip here. They will cripple the ship's computer."

"Sheldon," DeLaTorre cried, "are you mad? The computer oversees *life support*."

"I would rather not use this," Silverman said calmly. "But I am utterly determined that the information we have heard will be the exclusive possession of the United States of America—or of no one."

I watched diplomats and soldiers carefully for signs of suicidal bravery, and relaxed slightly. None of them

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was the kind of fool who jumps a gunman; their common expression was intense disgust. Disgust at Silverman's treachery, and disgust at themselves for not having expected it. I looked most closely at Chen Ten Li, who *had* expected it and had promised to kill Silverman with his hands—but he was totally relaxed, a gentle, mocking smile beginning at the corners of his lips. Interesting.

"Mr. Silverman," Susan Pha Song said, "you have not thought this thing through."

"Colonel," he said ironically, "I have had the better part of a year in which to do little else."

"Nevertheless, you have overlooked something," she insisted.

"Pray enlighten me."

"If we were all to rush you now," she said evenly, "you might shoot perhaps two or three of us before you were overwhelmed. If we do not, you will certainly kill us all. Or had you planned to hold a gun on us for two years?"

"If you rush me," Silverman promised, "I will kill the computer, and you will all die anyway."

"So either we die and you return to Earth with your secret, or we die and you do not." She put a hand on the wall on either side of her.

"Wrong," Silverman said hurriedly. "I do not intend to kill you all. I don't have to. I will leave you all in this room. My pressure suit just so happens to be in the next room—I will put it on and instruct the computer to evacuate all the compartments adjacent to this one. I will of course have disabled your own terminal here. Air pressure and the safety interlocks will prevent you from opening a door to vacuum: a foolproof prison. And so long as I detect no attempts to escape on the phone, I will continue to permit food, air and water systems to operate in here. I have the necessary program tapes to bring us back to Earth, where you will all be treated as prisoners of war under international conventions."

"What war?"

"The one that just now started and ended. Haven't you heard? America won."

"Sheldon, Sheldon," DeLaTorre insisted, "what can you hope to accomplish by this insane expedient?"

"Are you kidding?" Silverman snorted. "The biggest component of capital investment in space exploitation is life support. This moon full of fungus is a free ticket to the whole solar system—with immortality thrown in! And the United States is going to have it, that I promise you." He turned to Li and Dmirov and said, with utter sincerity, the most incredible sentence I have ever heard in my life: "I am not going to allow you to export your Godless way of life to the stars."

Chen actually laughed out loud, and I joined him.

"One of those Canuck socialists, eh, Armstead?" Silverman snarled.

"That's the thing that bugs you the most, isn't it, Silverman?" I grinned. "A *Homo caelestis* in symbiosis has no wants, no needs: *there's nothing*

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you can sell him. And he submerges himself in a group: a natural Commie. Men without self-interest scare you silly, don't they?"

"Pseudophilosophical bullshit," Silverman barked. "I'm taking possession of the most stupendous military intelligence of the century."

"Oh my God," Raoul drawled disgustedly. "Hi Yo Silverman, the John Wayne of the Spaceways. You're actually visualizing soldiers in symbiote suits, aren't you? The Space Infantry."

"I like the idea," Silverman admitted. "It seems to me that a naked man with a symbiote would evade most detection devices. No metals, low albedo—and if it's a perfect symbiosis there'd be no waste heat. What a saboteur! No support or supplies required . . . by God, we could *use infantry to interdict Titan.*"

"Silverman," I said gently, "you're an imbecile. Assume for a moment that you can bludgeon G.I. Joe into letting what you call a fungus crawl up his nose and down his throat. Fine. You now have an *extremely* mobile infantryman. He has no wants or needs whatsoever, he knows that he will be immortal if he can avoid getting killed, and his empathic faculty is at a maximum. *What's going to keep him from deserting?* Loyalty to a country he'll never see again? Relatives in Hoboken, who live in a gravity field that'd kill him?"

"Laser beams if necessary," he began.

"Remember how fast we were dancing there before the end? Go ask the computer whether we could have danced around a laser beam—even a computer operated one. You said yourself we'd be bloody hard to track."

"Your military secret is worthless, Silverman," Tom said.

"Better minds than mine will work out the practical details," he insisted. "I know a military edge when I see one. Commander Cox," he said suddenly, "you are an American. Are you with me?"

"There are three other Americans aboard," Cox answered obliquely. Tom, Harry, and Raoul stiffened.

"Yeah. One's got a pregnant Canadian wife, two are perverts, and all three are under the influence of those alien creatures. Are *you* with me?"

Bill seemed to be thinking hard. "Yeah. You're right. I hate to admit it, but only the United States can be trusted with this much power."

Silverman was studying him intently. "No," he decided. "No, Commander, I'm afraid I don't believe you. Your oath of allegiance is to the United Nations. If you had said no, or answered ambiguously, in a few days I might have believed a yes. But you are lying." He shook his head regretfully. "All right, ladies and gentlemen, here is how we shall proceed. No one will make a move until I say so. Then, one at a time, on command, you will all jump to that wall there with the dancers, farthest from the forward door. I will then back out this door, and—"

"Mr. Silverman," Chen interrupted

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gently, "there is something everyone in this room should know first."

"So speak."

"The installations that you made at Conduits 364-B and 117-A, *and* at the central core, were removed and thrown out the airlock some twenty minutes after you completed them. You are a clumsy fool, Silverman, and an utterly predictable one. Your transmitter is useless."

"You're lying," Silverman snarled, and Chen didn't bother to answer. His mocking smile was answer enough.

Right there Silverman proved himself a chump. If he'd had the quickness to bluff, to claim *other* installations Chen didn't know about, he might even then have salvaged something. I'm sure he never thought of it.

Bill and Colonel Song made their decisions at the same instant and sprang.

Silverman pressed a button on the transmitter, and the lights and air conditioning *didn't* go out. Crying with rage, he stuck up his silly gun and fired.

Ian Fleming to the contrary, the small Baretta is a miserable weapon, best suited to use across a desk. But the Lord of Chaos worked with Silverman. The slug he aimed at Bill neatly nicked open Colonel Song's jugular, ricocheted off the wall behind her—he was directly opposite Silverman—and smacked into Bill from behind, tumbling him and adding acceleration.

Silverman was not a complete idiot. He had expected greater recoil in free fall and braced for it. But he was expecting his own slug to bring Bill to him quicker—before he could reaim, Bill smacked into him. Still he retained his grip on the pistol, and everyone in the room jumped for cover.

But by that time I was across the room. I slapped switches, and the lights and air conditioning *did* go out.

It was simple, then. We had only to wait.

Silverman began to scream first, followed by Dmirov and DeLaTorre. Most humans go a little crazy in total darkness, and free fall makes it *much* worse. Without a local vertical, as Chen Ten Li had learned when his

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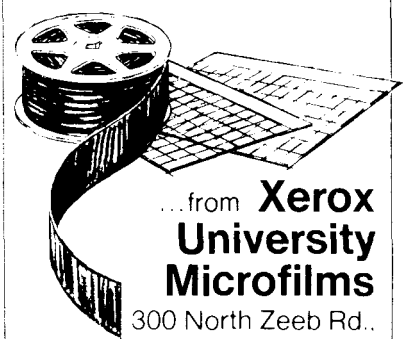

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bedroom lights failed, you are *lost*. The distress is primeval and quite hard to override.

Silverman hadn't learned enough about free fall—or else he hadn't heard the air conditioning quit. He was the only one in the room still velcro'd to a wall, and he was too terrified to move. After a time his screams diminished, became gasps, then one last scream and silence. I waited just a moment to be sure—Song was certainly dead already, but Bill's condition was unknown—then jaunted back to the switches and cut in lights and air again. Silverman was stuck like a fly to the wall, dying of oxygen starvation in a room full of air, an invisible bubble of his own exhalations around his head. The gun drifted a half meter from his outstretched hand.

I pointed, and Harry collected it. "Secure him before he wakes up," I said, and jaunted to Bill. Linda and Raoul were already with him, examining the wound. Across the room Susan Pha Song drifted limply, and her throat had stopped pumping blood. I had lived with that lady for over a year, and I did not know her at all; and while that had been at least half her idea, I was deeply ashamed. As I watched, eight or ten red softballs met at the air grille and vanished with a wet sucking sound.

"How is he?"

"I don't think it's critical," Linda reported. "Grazed a rib and exited. Cracked it, maybe."

"I have medical training," Dmirov of all people said. "I have never practiced in free fall—but I have treated bullet wounds before."

Linda took him to the first aid compartment over by the duckpins and frisbees. Bill trailed a string of red beads, that drifted in a lazy arc toward the grille. Dmirov followed Linda, shaking with rage or reaction or both.

Harry and Tom had efficiently trussed Silverman with weighed jump ropes. It appeared superfluous—a man his age takes anoxia hard; he was sleeping soundly. Chen was hovering near the computer terminal, programming something, and Norrey and DeLaTorre were preparing to tow Song's body to the dispensary, where grim forethought had placed supplies of embalming fluid.

But when they reached the door, it would not open for them. Norrey checked the indicator, which showed pressure on the other side, frowned, hit the manual override and frowned again when it failed to work.

"I am deeply sorry, Ms. Armstead," Chen said with sincere regret. "I have instructed the computer to seal off this room. No one may leave." From behind the terminal he produced a portable laser. "This is a recoilless weapon, and can kill you all in a single sweep. If any one threatens me, I will use it at once."

"Why should anyone threaten you, Li?" I asked softly.

"I have come all this way to negotiate a treaty with aliens. I have not yet done so." He looked me right in the eye.

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DeLaTorre looked startled. "Madre de Dios, the aliens—what are they doing while we fight among ourselves?"

"That is not what I mean, Ezequiel," Chen said. "I believe that Mr. Armstead lied when Commander Cox asked him if he was still human. We have yet to negotiate terms of mutual coexistence between his new species and our own. Both lay claim to the same territory."

"*How*?" Raoul asked. "We have no interests in common."

"We both propose to eventually populate what is known as human space."

"But you're welcome to any of it that's of any conceivable human value," Tom insisted. "Planets are no use to us, the asteroids are no use to us—all we need is cubic and sunshine."

"If ever *Cro-Magnon* and *Neanderthal* lived in peace in the same valley, it took an extraordinary social contract to enforce it," he insisted. "Precisely because you will need nothing that we need, you will be difficult to live with. As I speak I realize that you will be *impossible* to live with. Looking down godlike on our frantic scurrying, amused by our terrible urgency—how I hate you already! Your very existence makes nearly every living human a failure; and only those with a peculiar acrobat's knack for functioning spherically—and the resources to get to Titan!—can hope to strive for success. If you are not an evolutionary dead end, then most of the human race *is*. No, Stardancers: I do not believe we could ever share the same volume of space with you."

He had been programming the computer as he spoke, by touch, never taking his full attention from us.

"The world we left behind us was poised on a knife edge. It has been a truism for a long time that if we did not blow ourselves up by the year 2000, the world would be past the crisis point, and an age of plenty would follow. But at the time that we left Earth, the chances of surviving that long were slim, I think you will all agree.

"Our planet is wound to the bursting point with need," he said sadly. "Nothing could push it more certainly over the edge than the erosion of planetary morale which your existence would precipitate—than the knowledge that there *are* gods, who have no more heed for man than man has for the billions and trillions of sperm and eggs that failed to become gametes. That salvation and eternal life are only for a few."

Ezequiel was glowering thoughtfully, and so was Dmirov, who had just finished bandaging Bill. I began to reply, but Chen cut me off.

"Please, Charles. I recognize that you must act to preserve your species. Surely you can understand that I must protect my own?"

In that moment he was the most dangerous man I had ever known, and the most noble. With love and deep respect I inclined my head. "Li," I said, "I concede and admire your logic. But you are in error."

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"Perhaps," he agreed. "But I am certain."

"Your intentions?" I knew already; I wanted to hear him state them.

He gestured to the computer terminal. "This vessel was equipped with the finest computer made. Made in Peking. I have set up a program prepared for me before we left, by its designers. A tapeworm program. When I touch the "Execute" key, it will begin to disembowel the computer's memory banks, requiring only fifteen minutes to complete a total core dump."

"You would kill us all, like Silverman?" DeLaTorre demanded.

"Not like Silverman!" Chen blazed, reddening with anger. At once he recovered, and half-smiled. "More efficiently, at the very least. And *for different reasons*. He wished this news communicated only to his own country. I wish it communicated to no one. I propose to disable this ship's deep space communications lasers, empty its memory banks and leave it derelict. Then I shall kill you all, quickly and mercifully. The bomb you call the planet cracker has its own guidance system; I can open the bomb bay doors manually. I do not believe I will bring my pressure suit." His voice was terrifyingly calm. "Perhaps the next Earth ship will find the aliens still here, four to five years hence. But Saturn will have eight moons and two Rings."

Linda was shaking her head. "So wrong, Li, so wrong, you're a Confucian legalist looking at the Tao—"

"I'm part of a frightened womb," Chen said firmly, "and it is my judgment that birth now would kill the mother. I have decided that the womb must reabsorb the fetus of *Homo caelestis*. Perhaps at the peak of the *next* cycle of the human race will be mature enough to survive parturition—it is not now. *My* responsibility must be to the womb—for it is all the world I know or can know."

It had begun at the instant that I asked him his intentions, knowing them already.

It had happened before, briefly and too late, at the moment of showdown with Silverman. It had faded again unnoticed by the humans in the room. There had been nothing visible to notice: our only action had been to darken the room. Which had been action enough, then; a telepathic group is pacifistic by nature.

But this threat was not to our freedom but to our existence as a species. For the second time in fifteen minutes, my family entered rapport.

Time spiraled down like an unwound Victrola. Six viewpoints melded into one. More than six camera angles: the 360° visual integration was merely useful. Six *viewpoints* combined, six lifetimes' worth of perceptions, opinions, skills, and insights impinged upon each other and coalesced like droplets of mercury into a single entity. Since the part of us that was Linda knew Li best, we used her eyes and ears to monitor his words and his energy in realtime, while beneath

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and around them, we contemplated how best to bring tranquility to our cousin. At his only pause for breath, we used Linda's words to try and divert his energies, but were unsurprised to fail. He was too blind with pain. By the time the monitor fragment of her awareness reported that his finger was tensing to reach for the "Execute" key, the whole of us was more than ready with our plan.

All six of us contributed choreography to that dance, and polished it mentally until it filled our dancers' souls with joy. The first priority was the tapeworm program; the second was the laser. It was Tom the martial arts expert who knew precisely where and how to strike so as to cause Chen's muscles to spasm involuntarily. It was Raoul the visual effects specialist who knew where Chen's optical "blind spot" was, and knew that Norrey would be in it at the critical instant. Norrey *knew* the position of the racked frisbees behind her because Harry and I could see them peripherally from where we were. And it was Linda who supplied me with the only words that might have captured Chen's attention in that moment, fixing his gaze on me and his blind spot on Norrey.

"And what of your grandchildren, Chen Ten Li?"

His tortured eyes focused on me and widened. Norrey reached behind her with both arms, and surrendered control of them. Harry, who was our best shot, used her right arm to throw the frisbee that yanked Chen's right hand away from the terminal in uncontrollable pain reflex. Raoul, who was left-handed, used her left arm to throw the frisbee that ruined the laser and smashed it out of the crook of Chen's left arm. Both missiles arrived before he knew they had been launched; even as they struck, Tom had kicked Song's corpse between Linda and the line of fire in case of a miss, and Norrey had grabbed two more frisbees on the same chance. And I was already halfway to Chen myself: I was intuitively sure that he knew one of the ways to suicide barehanded.

It was over in less than a second of realtime. To the eyes of DeLaTorre and Dmirov we must have seemed to . . . *flicker* and then reappear in new relative positions, like a frightened school of fish. Chen was crying out in pain and rage and shame, and I was holding him in a four limbed hammerlock, conspicuously not hurting him. Harry was waiting for the ricocheting frisbees, retrieving them lazily; Raoul was by the computer, wiping Chen's program.

The dance was finished. And correctly this time: no blood had been spilled. We knew with a guiltless regret that if we had yielded to rapport more freely the first time, Song would not be dead and Bill wounded. We had been afraid, then, yielded only tentatively and too late. Now the last trace of fear was gone; our hearts were sure. We were ready to be responsible.

"Dr. Chen," I said formally, "do I have your parole?"

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He stiffened in my grip, and then relaxed totally. "Yes," he said, his voice gone empty. I released him, and was stunned by how *old* he looked. His calendar age was fifty-six.

"Sir," I said urgently, trying to hold him with my eyes, "your fears are groundless. Your pain is needless. *Listen to me:* you are *not* a useless by-product of *Homo caelestis*. You are not a failed gamete. You are one of the people who personally held our planet Earth together, with your bare hands, until it could birth the next stage. Does that rob your life of meaning, diminish your dignity? You are one of the few living statesmen who can help ease Earth through the coming transition—do you lack the self-confidence, or the courage? You helped open up space, and you have grandchildren—didn't you mean for them to have the stars? Would you deny them now? Will you listen to what *we* think will happen? Can happen? Must happen?"

Chen shook his head like a twitching cat, absently massaging his right arm. "I will listen."

"In the first place, stop tripping over analogies and metaphors. You're not a failed gamete, or anything of the kind, *unless you choose to be.* The whole human race can be *Homo caelestis* if it wants to. Many of 'em won't, but the choice is theirs. And yours."

"But the vast majority of us cannot perceive spherically," Chen shouted.

I smiled. "Doctor, when one of my failed students left for Earth he said to me, 'I couldn't learn to see the way you do if I tried for a hundred years.' "

"Exactly. I have been in free space, and I agree."

"Suppose you had *two* hundred years?"

"*Eh*?"

"Suppose you entered symbiosis, right now. You'd have to have a tailored environment of right angles to stay sane, at first. But *you'd be immortal.* With absolutely nothing better to do, could you not unlearn your gravitic bias in time?"

"There's more," Linda said. "Children born in free space will think spherically from infancy. They won't have to unlearn a lifetime of essentially false, purely local information about how reality works. Li, in free fall you are not too old to sire more children. You can learn with them, telepathically—and inherit the stars together!"

"All mankind," I went on, "all that wants to, can begin preparing at once, by moving to Trojan point O'Neill colonies and entering symbiosis. The colonization of space can begin with this generation."

"But how is such a migration to be financed?" he cried.

"Li, Li," Linda said, as one explaining to a child, "the human race is *rich*, as of now. The total resources of the system are now available to all, for free. Why haven't L-5 colonies gotten off the ground, or the asteroid mining that would support them? Silverman said it ten minutes ago: the biggest single component of expense has always been life support, and elaborate

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attempts to prevent the crew from adapting to free fall by simulating gravity. If all you need is a set of right angles that will last for a few centuries, you can build cities out of aluminum foil, haul enormous quantities of symbiote from Titan to Terra."

"Imagine a telepathic construction gang," Harry said, "who never have to eat or rest."

"Imagine an explosion of art and music," Raoul said, "raining down on Earth from the heavens, drawing every heart that ever yearned for the stars."

"Imagine an Earth," Tom said, "filled with only those who want to be there."

"And imagine your children-to-be," Norrey said. "The first children in all history to be raised free of the bitter intergenerational resentments that arise from a child's utter physical dependence on its parents. In space, children and parents will relate at eye level in every sense. Perhaps they need not be natural enemies after all."

"But you are not human!" Chen Ten Li cried. "Why should you give us all this time and energy? What is man, that you should be mindful of him?"

"Li," Linda said compassionately, "were we not born of man and woman? Does not the child remember the womb, and yearn for it all his life? Do you not honor your mother, although you may never be part of her again? We would preserve and cherish the Earth, our womb, that it may remain alive and fruitful and bear multiple births to its capacity."

"That is our only defense," I said quietly, "against the immense loneliness of being even *Homo caelestis* in empty space. Six minds isn't enough—when we have six billion united in undisturbed thought, then, perhaps, we will learn some things. All mankind is our genetic heritage."

"Besides," Raoul added cheerfully, "what's a few centuries of our time? *We're in no hurry.*"

"Li," I went on, "to be human is to stand between ape and angel. To be angel, as my family and I, is to float between man and the gods, *partaking fully of both.* Up here there can be no false concept of the 'high' and the 'low': how could we act other than ethically? Immortal, needing nothing, how could we be evil?"

"As a species," Tom picked up, "we naturally will deal only through the United Nations. Dr. Chen, believe me: we've studied this on something faster than computer time. There is no way for our plans to be subverted, for the symbiote to be hijacked. All the evil men and women on Earth will not stop us, and the days of evil are numbered."

"But," I finished, "we need the help and cooperation of you and every man like you, on the globe or off it. Are you up to it, Chen Ten Li?"

He drifted freely, in the partial crouch of complete relaxation, his face slack with thought and his eyes rolled up into his head. At long last his pupils reappeared, and life returned to his features. He met my eyes, and a gentle

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half-smile tugged at his mouth.

"You remind me greatly," he said, "of a *man* I once knew, named Charles Armstead."

"Dr. Chen," I said, feeling tension drain away. "Li my friend, I *am* that man. I am also something else, and you have rightly deduced that I am maintaining my six discrete conversational *personas* only as a courtesy to you, in the same way that I adapt my bodies to your local vertical. It demonstrates clearly that telepathic communion does not involve what you would call ego loss." Shifting *persona* as I spoke, so that each of us uttered a single word, I/we said:

"I'm"

"more"

"than"

"human"

"not"

"less."

"Very well," Li said, shaking his head. "Together we will bring the millennium to our weary planet."

"I am with you," DeLaTorre said simply.

"I too," Dmirov said.

"Let's get Bill and Colonel Song's body to sickbay," six voices said.

And an hour later we six departed for the Starseeder's location. We didn't bother with the shuttlecraft, this time. Our suit thrusters held enough for a one way trip.

CHAPTER TWELVE

Saturn burned ocher and brown against an aching blackness so vast it was barely interrupted by the cold light of a billion billion suns.

We danced as we jetted through that blackness, almost without thinking about it. We were leaving human life behind, and we danced our leaving of it. Essentially each of us created our own *Stardance*, and the great empty cosmic hall rang with Raoul's last symphony. Each dance was individual and self-complete; each happened to mesh with the other three and with the music, in a kind of second-level statement; and although all of these were conceived without any perceived constraints of time or distance, Harry's overawareness saw to it that all five works of art happened to end, together, before the aliens. It was always Harry who made us meet our deadlines.

None of this was taped. Unlike Shara's *Stardance,* this was not meant to be witnessed. It was meant to be shared, to be danced.

But it was witnessed. The Starseeders (aliens they were *not*) writhed in something analogous to applause as we hung before them, gasping for breath, savoring the feel of the last sweat we would ever know.

We were no longer afraid of them.

YOU HAVE MADE YOUR CHOICE?

Yes.

IT WILL BE A FINE BIRTHING.

Raoul hurled his Musicmaster into deep space. *Let it begin without delay.*

AT ONCE:

There was an excitement in their dance, now, an elemental energy that

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somehow seemed to contain an element of humor, of suppressed mirth. They began a pattern that we had never seen before, yet seemed to *know* in some cellular fashion, a pattern that alternated between the simple and the complex, without ever resolving. The Harry part of our mind called it "the naming of pi," and all of us watched it unfold raptly. It was the most hypnotic pattern ever dreamed, the dance of creation itself, the most essential expression of the Tao, and the stars themselves seemed to pay attention.

And as we stared, transfixed, the semivisible sphere around the Starseeders began for the second time to weep bloody tears.

They coalesced into a thin crimson ring about the immense sphere, then contracted into six orbiting bubbles.

Without hesitation, we each jetted to a bubble and plunged inside. Once we were in, we skinned out of our p-suits and flung them at the walls of our bubbles, which passed them out into space. Then the bubbles contracted around and into and through us.

Things happened on a thousand different levels, then, to all six of me; but it is Charlie Armstead who is telling you this. I felt something cool slide down my throat and up my nostrils, suppressed gag-reflex with free fall training, thought briefly of Chen Ten Li and the ancient Chinese legends of edible gold that brings immortality—felt suddenly and forever a total awareness, knowledge and control of my entire body and brain. In a frozen instant of timelessness, I scanned my life's accumulation of memories, savored them, transmitted them in a single sending to my family and savored theirs. Simultaneously I was employing eyes that now saw a wider spectrum to see the universe in greater depth, and simultaneously I was playing the keys of my own internal sensorium, tasting crisp bacon and Norrey's breast and the sweet taste of courage, smelling woodsmoke and Norrey's loins and the sweet smell of caring, hearing Raoul's music and Norrey's voice and the sweet sound of silence. Almost absentmindedly I healed the damage to my hip, felt complete function return as if it had never been gone.

As to happenings on a group level, there is not much I can tell you that will mean anything. We made love, again almost absentmindedly, and we all felt together the yearnings toward life in Linda's belly, felt the symbiote that shielded her body make the same perception and begin preparing its own mitosis. Quite consciously and deliberately, Norrey and I conceived a child of our own. These things were only incidentals, but what can I tell you of the essentials? On one major level we shared each other's every memory and forgave each other the shameful parts and rejoined in all the proud parts. On another major level we began what would become an ongoing lifetime symposium on the meaning of beauty. On another we began planning the last details of the

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migration of man into space.

A significant part of us was pure plant consciousness, a six petaled flower basking mindlessly in the sunlight.

We were less than a kilometer from the Starseeders, and we had forgotten their very existence.

We were startled into full awareness of our surroundings as the Starseeders once again collapsed into a single molten ball of intolerable brilliance—and vanished without a good-bye or a final sending.

They will be back, in a mere few centuries of realtime, to see whether anybody feels ready to become a firefly.

In stunned surprise we hovered, and, our attention now focused on the external universe, saw what we had missed.

A crimson winged angel was approaching us from the direction of Saturn's great Ring. On twin spans of thin red lightsail, an impossible figure came nearer.

Hello, Norrey, Charlie, the familiar voice said in our skulls. *Hi Tom, Harry. Linda and Raoul, I don't know you yet, but you love my loved ones—hello.*

Shara! screamed six voiceless brains.

Sometimes fireflies pick up a hitchhiker.

But how—?

I was more like an incubator baby, actually, but they got me to Titan alive. That was my suit and tanks you saw burning up. They were desperate and overeager, just as they said. I've . . . I've been waiting in the Ring for you to make your decision. I didn't want to influence its outcome.

The snowflake that was me groped for "words."

You have made a good marriage, she said, *you six.*

Marry us we cried.

I thought you'd never *ask.*

And my sister swarmed into me and we are one.

That is essentially the whole of this story.

I—the Charlie Armstead component of "I"—began this work long ago, as an article for magazine and computerfax sale. So much nonsense had been talked and written about Shara that I was angry, and determined to set the record straight. In that incarnation, this manuscript ended with Shara's death.

But when I was done, I no longer needed to publish the article. I found that I had written it only to clarify things in my own mind. I withheld it, and hung on to the manuscript with the vague idea of someday using it as a seed for my eventual memoirs (in the same spirit in which Harry had begun his book: because someone had to and who else was there?). From time to time, over the next three years, I added to it with that purpose in mind, "novelizing" rather than "diarizing" to spare the trouble of altering the manuscript later. I spent a lot of the year of *Siegfried's* outward flight in writing and revising the total, bringing

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the history up to the point where Chen Ten Li took his first space walk, a few weeks out of Saturn.

All of the subsequent material has been written in a single half-day "sitting" here at the Die's computer terminal. I have been limited only by the physical speed at which the terminal's heat sensitive "keys" can disengage. As I write, other parts of me drift through eternity. We make love. We worship. We sing. We dance. Endlessly we are each other, yet are ourselves. I know it does not seem that this could be; that is why I have chosen to tell my story by completing Charlie's memoirs (while Shara, approving, reads over my shoulder from a hundred klicks away). I want you to know that Charles Armstead has not been dissolved or diluted into something alien. In *no* sense have I died. I never will. It would be more accurate to say that I am Charlie Armstead to the seventh power. At long last, I have managed to destroy the phone company, and great is my glee. I still choreograph dances with Norrey and Shara and the others, still swap abominable multilevel puns with Raoul (right now he's singing an old '40s love song, "I May Never Come Back to Earth Again"), still taste in my mind (where I always did) the smell of fine coffee, the bite of strong drink, the flavor of good grass. The distance between me and you is only time and changes. Once I was a bitter, twisted cripple, poisoning the air around me; now I know no evil because I know no fear.

I have spent the minuscule fraction of energy to complete this manuscript because Bill Cox is preparing to blast for Terra (he'll be back) and it must go now if ever.

This news will not fit into any diplomat's laser message, nor will even those extraordinary men and woman be able to express it as I can.

I am Charlie Armstead, and my message to you is: the stars can be even yours. ■

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ENDGAME

"Right ten," said Masaryk, almost under his breath. His eyes were fixed on the low coastline that purpled the horizon to starboard.

"Right ten, aye," repeated the helmsman, and a second later came the soft creak of the steering ropes against the ship's wheel. The *San Francisco* was moving slowly, for the early morning wind was light; almost a minute passed before the movement of the bowsprit against the low coast became apparent.

Masaryk looked upward, into the rigging. The mainsails—two of them, for the warship was schooner-rigged—were only partially filled, and their canvas bellied loosely, spilling what little wind there was. He considered trimming them, but decided against it for now. The crew had been called to battle stations four times since last night, and most of them, exhausted, were now asleep belowdecks. If the enemy showed himself again the captain would want them all on deck in seconds, and until he did, Masaryk judged that another knot or two of

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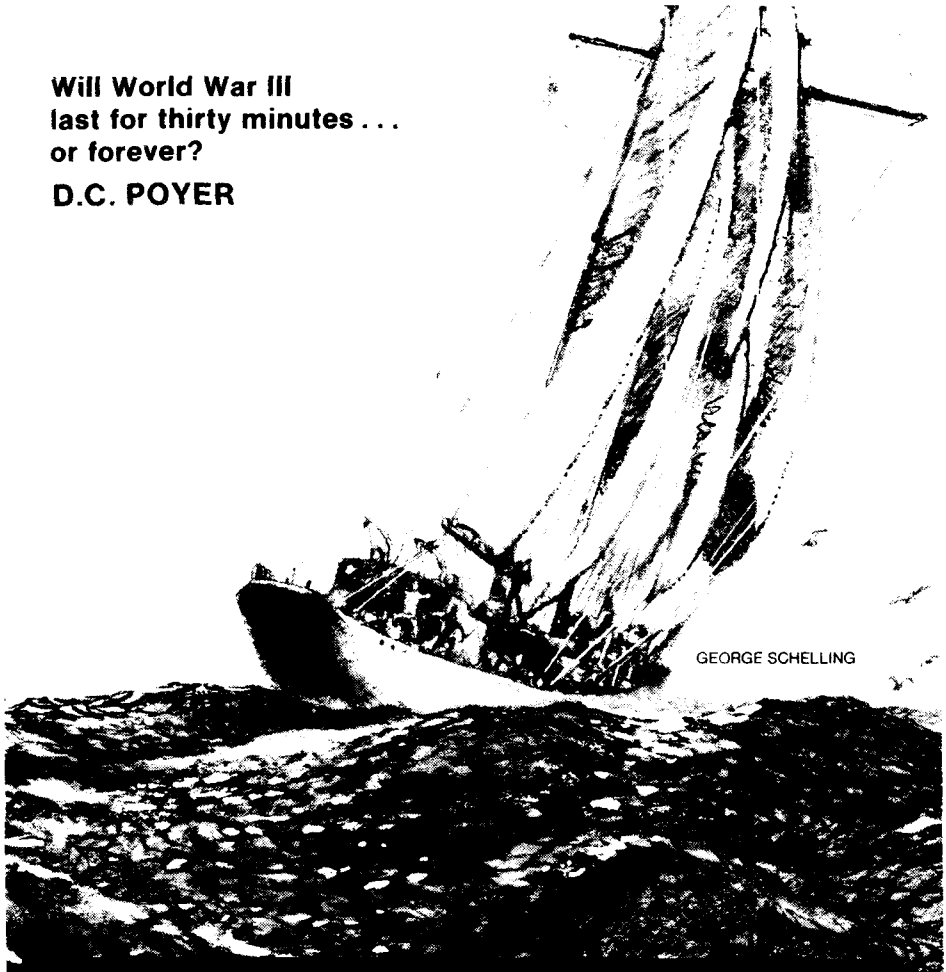
Will World War III last for thirty minutes . . . or forever?

D.C. POYER



GEORGE SCHELLING

speed was not worth waking the men up.

His gaze traveled higher, up to the very top of the forward mast. A flick-flick-flick of sunlight assured him that the little Raytheon piloting radar, salvaged from a beached tugboat, was still rotating up there. In the crow's nest, just below it, he could see the end of the lookout's spyglass, restlessly searching the horizon for the first disturbance of the wind-ruffled surface of the Black Sea. Everything was in order, but the young officer still stood tensely beside the helmsman, for the captain was still on deck, leaning over the rail and looking off toward the Russian coast.

"Steady as she goes," said Masaryk.

"Steady, aye," responded the helmsman, slapping his calloused hands briskly on the wheel-spokes, bringing the rudder back amidships.

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The routine exchange of order and acknowledgement seemed to bring captain Friesen out of his reverie. The tall, emaciated figure turned abruptly from the rail. Masaryk noticed that, though the captain looked in his direction, his eyes were still distant, as if fixed on the remote beaches of the Crimea.

"I'm going below to my cabin, John. Stay alert. Call me if he shows himself."

"Yes, sir," said the ensign, touching his cap, in a remnant of the old salute. His eyes followed the thin old man as he descended the companionway, ducking his head to avoid the low wooden coaming on the way down the ladder. When he had disappeared from sight, the younger man walked to the hatch and looked down, making sure that he was gone.

When he was quite sure, John Masaryk let out his breath and relaxed a little. For the first time that watch, he leaned against the binnacle, catching a glimpse of his reflection in the brightly polished brass.

Compared to the captain, or even the helmsman, he looked boyish—he was only seventeen. He rubbed his cheek. His face had the hollowness, the deep eyesockets of his generation. Unconscious of the enlisted man's amused glance, Masaryk scowled at himself in the binnacle's surface, trying to look commanding.

To look like Friesen.

A few feet below Masaryk, captain Friesen was writing rapidly. Occasionally he would pause to reach up and adjust the wick of a gimballed lamp that swung slowly in the middle of his tiny cabin. After ten minutes of writing, he leaned back and reread what he had produced, nodding in satisfaction. He signed his name, then underlined the date in his logbook. It was not really a logbook; it was, or had once been, a blank diary, bearing the date 1979. With bold, dark, decisive strokes Friesen drew his pen across the 79, and drew in *1987*. Abruptly, the satisfied expression changed, a wave of bitterness and hate sweeping across his face.

Friesen gripped the edge of his desk until his hands went numb. His teeth ground together, and the muscles of his thin arms shuddered with the intensity of his struggle against his emotions.

For most of the day Friesen had found that he could forget, could lose himself in the absorbing business of commanding a warship within the territorial waters of an enemy. But when he opened this book—a book that should have been, despite the crudely stamped "PROPERTY OF US NAVY" on the cover, sitting on the bureau of some teenaged girl—the date, four little numerals, would reach out and drag Harold Friesen, captain of the frigate *San Francisco*, back into the blood and horror of the first days of the war.

It had been Doctor Friesen then. Not M.D., but Ll.d.; professor of law at a small college in Rhode Island. The initial exchange of weapons, on the

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sixth of June, had missed him—thanks to a fishing trip. The discovery, after fighting his way home through the panic and destruction that blanketed the eastern seaboard, that Jeanne and Eric were gone, had been only the beginning.

And at that, Friesen had been luckier than three out of five Americans; he was alive.

It had been predicted many times before the war. The initial exchange, all the strategists had agreed, would more than decimate the populations of the combatants. But somehow it had always been assumed that the result would be peace . . . peace perhaps with defeat, or the peace of mutual destruction, but at least the war would stop.

Exactly as, in 1914, the General Staffs of both sides, knowing the awful power of the machine gun, had planned for a war that could never last for more than a few weeks.

Friesen slowly opened his hands and leaned back, fighting for surcease. He had realized long before that he would never be able to forget; but to plunge himself into this bath of pain to the deepest, to remember, once a day, remember it all—this could release him from it for a time. And so, drawing great shuddering breaths, Friesen went over it again in his mind.

The war that began in June of 1979 was not over in a day, though at the end of that day three hundred million had died. Was not over in a month, though the stockpiles of strategic and tactical weapons were exhausted, with more hecatombs of dead. Was not over in a year, despite the fact that the entire industrial infrastructure of the United States and the Soviet Union had been photographed by satellite, carefully plotted, and sedulously destroyed. As for Europe, after the first week there had been nothing left to destroy.

And the war was not over yet, though it was 1987, and it was eight years old. Though the combatants had pushed each other, step by step, back down the ladder of technology they had both climbed at such sacrifice.

Until 1987. The major units of the Navy were built of wood—for there were no longer blast furnaces to make steel. Were powered by wind—for there were no longer factories to make engines. They were equipped from odds and ends salvaged from wrecks, manned by the nondescript flotsam that remained of a destroyed population, and named after the cities that were now leveled miles of radioactive concrete. With this equipment, matched on the Soviet side by nothing better, the war had dwindled to a close blockade of the Russian coast.

Friesen's body had gradually relaxed, and now he sat for some minutes with his eyes blank and unfocused. Finally he stirred, looked round the cabin. He reached under his bunk and came up with an old quart beer bottle, half-filled with homemade corn whiskey. He took one swig, considered, then put it back, not without regret. If the enemy reappeared, he would have to be sober.

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For a second time he reread the log entry for that day.

Tuesday. Morning star fix places us ten miles off the Russian coast, near the center of interdiction area BV320. Spent the night prosecuting the submarine contact obtained yesterday. It surfaced briefly a little before dusk, apparently unaware of our shadowing. To me this means it lacks any sonar equipment; not surprising in view of Air Force concentration on Soviet electronics industry. I carried out an attack as soon as it appeared on the surface. Five shells were expended from the forward gun; one misfire; the sub dove before a solid hit could be made. One shell burst close aboard, though, and may have caused some damage.

Continued to trail and prosecute throughout the night. In my opinion, the enemy will shortly be forced to the surface by his need for fresh air. When he does so I will press the attack until one of us is destroyed.

The submarine! For all he knew it was the last operating sub left in any navy. The sea war, like that on land, had been vicious and without quarter. The last few modern ships had been targeted by the last Soviet missile-carrying satellites. Since then the war had become much quieter. Neither side had the technology to produce more nuclear weapons, and so the war had become a stalemate. Like two exhausted bare-knuckle fighters, both countries lay panting in the ring, too weak to strike a blow, but whispering obscenities of hate. And Friesen, too, as he sat in his small cabin, was filled with hate. If he had his wish, the war could go on forever, till man was forced back into the eolithic, till only bands of hunters were left wandering between the burned cities.

But what was a submarine doing here?

Friesen had been thinking about that all night, up on deck, while he stood looking out over the rail. And certain conclusions had begun to form in his mind.

It was an old submarine. That much was evident from its behavior. Judging by the cloud of smoke it had vented while on the surface the night before, it was propelled in the old style, by diesels, and thus by a slow electric motor when submerged. It could not be new construction, since the Russians had long ago lost the ability to fabricate a pressure hull, or even to smelt steel in large quantities. Therefore, Friesen had concluded, they had probably raised a sunken hull and refitted it with what primitive machinery they could muster.

Why go to all that trouble to put a submarine to sea?

Another thought, a pleasant one, occurred to him. They had been down now for over fifteen hours. Friesen's lips curled in a cruel smile as he thought of what it must be like down there in that steel shell. They must be choking alive.

Friesen continued to meditate on this gratifying image, until the hollow

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sound of steps stopped outside his cabin door. "Come in, please," he called, hearing a knock.

Someone was rapping, drumming, banging on his head. Or was it . . . was it the Yankee ship come back, and were those explosives detonating against the hull? The short, balding man moved his arms, clawed at the noxious mists, and slowly, painfully rose to semiconsciousness. He realized that someone was knocking on his door.

"Come in," shouted Getsayev hoarsely.

A senior rating staggered in, almost filling the meter-square space that passed in the Soviet submarine, for the captain's stateroom. He remained upright for a second, started to salute, then tottered and collapsed onto the bunk on top of Getsayev.

Getsayev summoned what little strength remained to him and slapped the man, who moved his head from side to side slowly until his filmed eyes found the captain's. "What is it?" said Getsayev impatiently.

"The American ship," said the man. He was over sixty, and Getsayev could see that he was close to death. The fact irritated him, as most things about his crew irritated him.

"Still there?"

The rating nodded weakly. "Slow moving slowly. But we can't outrun, Comrade Captain. Batteries almost dead."

"Shit," said Getsayev aloud, and tried to force his brain to function. His mind was like an old horse that has to be whipped before it can stand up.

Getsayev had surfaced at dusk the night before to purge the atmosphere after a day of searching. His lookouts had been useless—just as he had expected. The captain himself had seen the ship bearing down on them, sails spread, and he had been able to get below before the Yankee's guns had made a hit. Still, there was a slow leak from the conning tower hatch; one shell, bursting right next to the sub, had sprung it part-way open.

They had been submerged since then. Getsayev had been unable to get any kind of listening device, and since the American sailing ships made no machinery noise, it would have been useless anyway. Only a stealthy, risky look through the periscope could tell whether it was still above them. And the pursuer had not yet given up. Americans—Getsayev spat. He hated them. Unconsciously he fingered the terrible burns that disfigured the lower half of his face.

It had been an American disease that had killed his family in 1980. Marja and Yekaterina had survived the bombings almost miraculously, hidden deep in an Odessa bomb shelter. But the plagues . . . the diseases, the strange sicknesses that crept and killed, no one knew how, these they did not escape. And everyone said these diseases came from America. (There were also rumors that they came from Soviet laboratories wrecked by American bombs. But Getsayev did not believe this. The

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CCCP, the provisional government at Smolensk said, had never had bacteriological laboratories. So the rumors were lies.)

Vselovod Nikolayevich Getsayev had reason to hate Americans.

And now they were above him, in the very waters of the Motherland, torturing him to death.

Hate gave him strength, and suddenly Getsayev was able to move. He swung his legs over the edge of his straw-stuffed bunk. They felt as if they were made of wood, but he staggered up, out of the cabin, and slowly made his way toward the control room.

When he reached it, he could hardly see through the hazy air in the cramped compartment. The air was foul, thick; moisture condensed from it on the cool metal of the bulkheads, ran down and collected in little pools on the floor. The deck yielded under his feet, and he lifted his heavy legs over two recumbent bodies lying on the gratings. His heart hammered, and red and white lights danced before his eyes.

"Depth?" he grunted.

"Twenty meters, comrade captain," responded the second officer. Pyatnitsky was an old man, but sharp, cool, an old mariner; he was the only man aboard who had survived the death of the Soviet Navy, and had served on steel ships with missiles. Getsayev disliked him for only one reason: Pyatnitsky was slack, far too easy on the crew.

"Extend periscope," snapped Getsayev, angrily cuffing Pyatnitsky aside. He drummed his fingers, leaning against the curved pressure hull, while a seaman slowly cranked the makeshift 'scope up. When it was clear of the surface he stepped to it and made a complete circle of the horizon above.

"Message for you, Cap'n," said the radioman, stepping inside.

"Thanks," said Friesen, taking the slate board (paper was too scarce to waste on messages). "You can wait outside. I'll hand the board out to you."

The messenger closed the door gently, and Friesen sank back in his chair, studying the message. It was top priority, a reply to his message of the night before. It was fortunate, he reflected, that shortwave radio was so simple; it was almost the only means of longrange communication left, though radiation static limited its dependability this close to Russia. But the San Fran had a skilled radioman; the neatly block-printed message in his hand was proof of that.

TO USS SAN FRANCISCO DE NAVDEPT LITTLEPENTAGON. RE YOUR MESSAGE: NO PREVIOUSLY REPORTED SUB ACTIVITY BLACK SEA OR MEDITERR SEA. NO ENEMY SUB ACTIVITY REPORTED FOR LAST FOUR YEARS. INTELLIGENCE ANALYSIS COMMENCED RECEIPT YOUR REPORT. CONCLUSION: ON 7 JUNE 1977 A ROF (REPUBLIC OF FRANCE) MIRAGE VI FIGHTER BOMBER CRASHED/DITCHED IN BLACK SEA. LAST REPORTED POSITION CORRESPONDS PRESENT INTERDICTION

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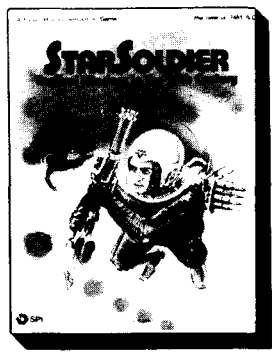

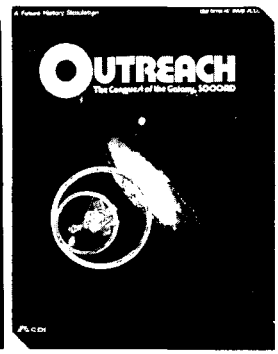

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*AREA BV320. THOUGH NO ROF GOVERNMENT EXISTS FOR CONFIRMATION, OBVIOUS CONCLUSION IS THAT AIRCRAFT CARRIED FULL FORCE DE FRAPPE WAR LOAD OF THREE ONE MEGATON AND POSSIBLY TWO ADDITIONAL 100 KILO TON NUCLEAR WEAPONS. IN VIEW THIS INFORMATION, PRESENCE OF SUB IN YOUR AREA INDICATES ATTEMPT TO SALVAGE THESE WEAPONS FOR PURPOSE OF DELIVERY AGAINST ALLIED FORCED. ORDERS. YOU ARE DIRECTED TO LOCATE AND RECOVER THESE WEAPONS FOR USE AGAINST ENEMY. IF OPPORTUNITY OFFERS DESTROY SUBMARINE; HOWEVER, WEAPONS HAVE PRIORITY. ACKNOWLEDGE * ACKNOWLEDGE * ACKNOWLEDGE* ACKNOWLEDGE * ACKNOWLEDGE * ACKNO*

"Good God," said Friesen aloud, his eyes riveted to the slate. He raised his voice, to carry through the closed door. "I'm going to hold on to this for a while. Do you have another slate you can use if something else comes in?"

"No, sir," said the radioman, sticking his head back in.

Friesen tore a page out of the diary—the log, he reminded himself—an address page, blank. "Here's paper," he said. "Use this if anything priority or above comes in. And acknowledge that last message right away."

Friesen went topside, still holding the slate in his hand, and found Masaryk searching the sea with a spyglass. He stood behind the boy, thinking. He had doubts about the boy; he was a good enough sailor, yes, and learned fast; he was respectful, and had good judgment too; Friesen had been waiting for him to call the men topside to trim the sails, but the boy had let the men sleep after the hectic night. That was good.

But did he have the motivation, the will and determination to press the war home to a successful conclusion? So many of the youngsters seemed to lack it. *God knows,* Friesen thought, *after eight years of war I'm tired too. But too much has been lost to stop now.* Something inside . . . something inside had to drive a man on. Something like the memories of a dead wife and son, a lost home, a lost country.

Something the boys like Masaryk didn't seem to have.

He tapped the boy on the shoulder. "John, when did we secure from battle stations?"

"Oh . . . sorry, sir, didn't see you come up," said the ensign, turning red. "It was at oh-four-hundred this morning."

"Call the sailing watch on deck. When they get up here I want you to bring us about."

"Bring her about, sir? But the sub. . . ."

"Yes. Bring her about." He showed the slate to the boy. "Bigger game afoot, John. Little Pentagon thinks the sub is after a French bomber that ditched in our operations area in '79. There might be nukes aboard the wreck, as many as five."

"Nukes!" said Masaryk.

"Yes. It would be nice to be able to throw some of those at them, wouldn't it? Can you get someone else to take

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the watch? I want all officers in the forecastle as soon as you can wake them up."

"Aye, captain," said Masaryk, eyes wide, and Friesen went below to get his charts.

Getsayev swore weakly, but his words were ferocious.

"Still up there, comrade captain?" said Pyatnitsky, his furrowed old face shining with perspiration.

"Wait," snapped Getsayev, his face glued to the crude setup of pipes and mirrors that substituted for a periscope. "I thought it was my eyes . . . but she's stern to. They're sailing away, old man!"

The sailors in the control room, those who were still conscious, looked at each other with hope in their eyes. As the minutes ticked by the tension grew. At last Getsayev turned from the 'scope and said, "Bring her up. Let's get some air to breathe."

There were a few smiles, but nothing like a cheer. The captain's grimness and cruelty had touched every man on the ship. The old men and boys who could still move staggered to hand-operated valves and pumps. Air hissed, and the sub lifted slowly upward from the shallow sea.

Vselovod Nikolayevich continued to look through the 'scope as they rose. As the sub broke water the periscope was lifted high, and the American ship came into view again above the expanded horizon. It was still sailing away; it had not been, as he half suspected, a trick to get them to surface. The Yankee had really abandoned the attack.

Getsayev suddenly realized where the other ship might be bound. He looked to the left, at the low Russian coast, then again at the shrinking sails of the ship. He took his eye from the periscope, tasting as he did so the first draft of fresh air coming down the newly opened hatch, and looked at a chart taped to the bulkhead. Though he was not conscious of it, his scarred lips had drawn back in a grimace. The Americans must have fathomed the sub's purpose.

Hatred rose in him like a flood tide, draining the blood from his face, but paradoxically reddening the terrible burns. So they knew about the bomber—so much the worse for them. He, Getsayev, would search for it, and the Yankees could search for it too. And when one of them stumbled on the sunken bomber, he would laugh long and loud as he watched them drown.

The last torpedo the Soviet Navy possessed lay in gray tumescence in a rack on board.

Friesen and three other men sat in a small circle on the foredeck, the sail pulling taut overhead, the midmorning sun their illumination. Its rays fell on a yellowing nautical chart of the Black Sea, which Friesen had preserved by gluing it to a piece of plank and varnishing it. Charts were now precious. On the yellowing surface was lightly drawn the outline of Interdiction Area BV320, a five- by thirty-mile section of sea paralleling the

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beaches of the Crimea. Friesen had marked their approximate position with a small penciled X.

"We'll search in an expanding square pattern, commencing from the center of the Oparea," he began. "When we get to the center, have a buoy ready to drop, chief."

The leading chief, Eric Halloran, a stubby, silent old man, nodded and flicked a butt overboard, already rolling a fresh one. "Right. How you goin' to search the bottom, Cap'n?"

"The water's clear, Chief, and we don't stir it up like a powered ship does. Cut me a hole in the bottom and put in a piece of glass. I'll leave the how up to you. Rick, can you help him?"

Rick Kayle, thirty years old, was weapons officer and second in command. He looked puzzled. "I can give him a piece of Plexiglas I've been saving. But isn't that a bit much—a hole in the bottom? And will we be able to see that much?"

"Hole's no problem," said Halloran. "It's called fothering. A sheet of canvas against the hull from outside; water pressure'll keep it tight while I put the porthole in."

Friesen added, "And we'll be able to see the bottom. According to the chart, BV320 is only thirty meters deep; our hull goes down almost five meters; if there's a bomber on the bottom, we'll see it, all right. Ever been diving, Rick?"

"Once, before the war," said Kayle. A slightly wistful look passed over his face. "God, it was nice, then . . ."

"Then you know how well we'll be able to see, if the water stays clear. Well. I guess we've got our work waiting for us, gentlemen."

"What . . . what about the submarine, sir?" said Masaryk, gulping a little with nervousness at speaking to the captain.

Friesen smiled slowly, and Masaryk's eyes grew wide as he saw the wolfish hate in the captain's face. "That's right, John, he's out here looking for it too," he said. His voice sounded reasonable, but a little mad at the same time. "Rick, I need a depth charge. Can you jury-rig me one, a big one?"

Kayle's forehead creased in thought, and the same expression of hate played over his face. "Plenty of powder in the shells . . . the casing's no problem, I can use a cask . . . since it's so shallow, I can use a short fuse, make it waterproof with tallow. . . ."

"Get on it, Rick. Have your men make it, and I'll drop it. We obviously aren't going to get the red bastard to surface."

Masaryk looked around at the sparkling sea, the sunlit deck, and then back at the captain's face. In spite of the heat, in spite of his own desire to come to grips with the enemy, he felt something cold prickle along his spine.

Masaryk was at the 'window' when, three days later, they found the French bomber.

The water was clear; providentially,

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it was only a little past midday, and the sun illuminated the bottom brightly. Masaryk had been on watch for two hours, absorbed in watching the sea bottom gliding silently and smoothly by beneath him. It was soft mud, and the underwater currents had sculpted it into rolling brownish-green hillocks, with here and there patches of slowly waving weeds. Occasionally the ship passed over a group of rusty oil drums, a tangle of cable lost overboard from some freighter—reminders that before the war this had been an avenue of commerce.

Then, without warning, he was watching the ship's haloed shadow gliding over the broad back of a swept-winged aircraft. It was almost undamaged, save for a crumpling of the nose and a long tear that marred the left wing root; the rudder pointed up, not far below him. It was unquestionably the French bomber, for under a fine coating of brown mud he could make out the roundel.

As he sat paralyzed, mouth open, the apparition slipped silently away, and was gone behind the ship. Masaryk stared for a second more, then pelted up the ladder to the deck.

"You did? How long ago?" said Friesen.

"Fifteen seconds or so," panted the boy.

"Left full," said Friesen to the helmsman, at the same time sending a piece of weighted board over the side with a sweep of his long arm. It disappeared for a second, then bobbed back up: the weighted end hung down, and a meter of wood stuck up out of the sea like a signpost.

The captain brought the *San Francisco* about in a neat Williamson turn, dropped the sails and coasted slowly past the board, going in the opposite direction to her original course. "Throw a buoy over," he said to the chief, and to Kayle, "Rick, better man the guns, and get the depth charge ready to drop. Sooner or later that bastard is going to show up here."

"Right," said Kayle.

A splash came from astern as a buoy followed a heavy rock overboard.

A busy three hours followed. Halloran secured three grapples in the plane's fuselage and swung out the mainsail boom directly over the wreck, bending all three grapples to a block and tackle at its end. To keep the ship on an even keel as the heavy aircraft was raised he collected every piece of scrap metal and unused machinery aboard, netted it and hung it from the boom of the other mainsail, ready to swing that boom out when he took a strain on the bomber. "She'll still have a list," he explained to Friesen, sucking on one of his home-rolled cigars as his eyes followed the frenetic activity on deck. "But we should be able to get her to the surface. When she's awash I'll be able to cut my way into the fuselage, and then get at the bombs."

"Don't waste any time," said Friesen. "That sub's after this plane too." He looked over the side, toward the eastern horizon. "And the weather's deteriorating. I want those bombs

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aboard before dark, without fail."

"They're sitting ducks for a torpedo, comrade captain," said Pyatnitsky cautiously.

Getsayev leaned against the control room bulkhead, absently rubbing the lower half of his face. "No, can't do that," he said slowly. "The *blatnye* are right over the plane, judging from the way their booms are rigged. If I torpedo her now, I'll never get to the bombs; the ship will settle on top of them."

"And the bombs . . . a torpedo might set them off, too."

"The high explosive in them might detonate, but it wouldn't be in the proper order. There would not be a nuclear explosion," said Getsayev. Then, abruptly realizing that he was almost chatting with the old sailor, he shook himself and stepped to the periscope again.

The choppy waves that were beginning to rise cut off his vision from time to time, but they also hid the 'scope from the ship's lookouts. Getsayev studied the activity on the Yankee's decks. Was the ship riding lower in the water? They must already be trying to lift the bomber free of her muddy tomb. He had to do something, now, before they got the weapons aboard the schooner.

"Get three men ready to swim," he snapped to Pyatnitsky. "Issue a knife to each. Muster them at the forward escape hatch."

Dipping the periscope in and out of the waves, Getsayev worked the sub closer and closer to the ship. At last he brought it below the surface entirely, counted the beats of his screw until he felt he was directly under the ship, and then let the sub settle to the bottom gently. He went forward. Two of the youngsters were standing under the hatch, stripped naked, with goggles and knives. The third man was Pyatnitsky.

"I didn't mean you, old fool," said Getsayev. "I want someone who can swim."

"I can swim, comrade captain," said the old sailor. "And . . . I don't want to send them where I wouldn't go."

A second later he was bleeding from the mouth. Getsayev rubbed his bruised hand. "Get out there, then, soft old man," he sneered. "Show your men how it's done. Idiot." He spun on his heel and walked back to the control room. Behind him he heard Pyatnitsky start to explain their mission to the boys.

"They're cutting the lines to the plane!" said Masaryk, looking up from the strangely vibrating rope.

Halloran heard him and turned to his sweating sailors. "Slack off! You there, haul that counterweight inboard! Look alive!" He joined the ensign at the ship's side, and they both peered down into the green water. Only a brown shimmer, far below, was visible; it might or might not be the plane, most likely its vertical tail.

Friesen joined them. He took the situation in and took charge quickly. "Chief, take a look through the hull

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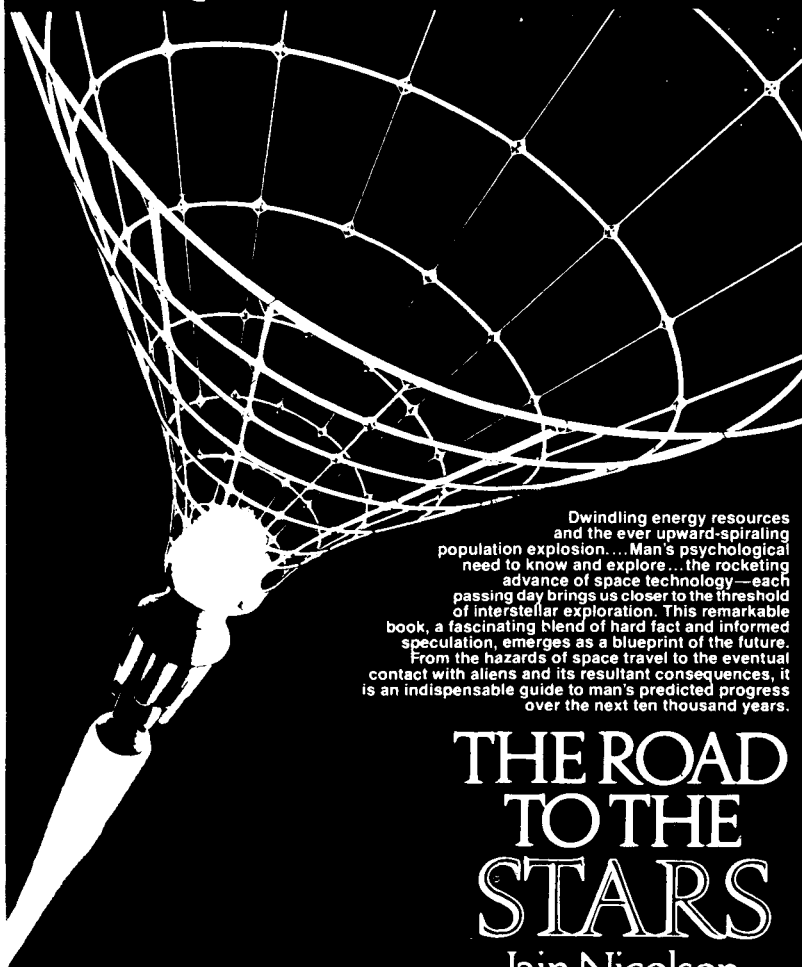

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window. John, go ask Mr. Kayle to break out some hand grenades." He too looked down. The ropes were vibrating more strongly, and one of them went suddenly limp. "Cut," said the captain, and Masaryk looked at him. His emaciated hands were clenched tight on the rail, and his teeth showed between drawn-back lips. "They're down there, now, trying to take them away from me. To kill more of us." He looked up, caught the boy looking at him, smiled, with an effort. "Not going to let them, are we, John?"

"No,—no, sir," said Masaryk hesitantly.

"Then get the grenades, boy."

But when he got back with the small box of prewar concussion grenades all the lines were slack, and Halloran was saying, "Sub's lying alongside the plane, cap'n. Swimmers went back inside through a hatch."

"Standoff, by God," said Kayle.

"Except for one thing," said Friesen. "We can stay over the plane for weeks. They have to come up for air. Load your guns, Rick, we'll wait them out."

"Right."

"John, take the watch. Get the anchor up, make sail. We'll circle the buoy. When she comes up I want to have steerageway."

"Yes, sir," said Masaryk. Chief Halloran was already shouting at the sailing watch.

It was at that moment that the lookout, far above them in the late afternoon sunlight, shouted, "Periscope! Close aboard—starboard!", and at almost the same insant, for an alert gunner had also seen the tube slide up out of the water, the forward gun went off with a low-pitched boom.

All was confusion for a few seconds, as Kayle was trying to get forward to his gun, Friesen trying to turn the ship to ram (but the sails were only halfway up, and the ship was hardly moving), and Masaryk was naively firing at the inquisitive eye with his service pistol, while Halloran made haste to get behind him. The ship's after gun misfired; its crew cursed the hand-loaded ammunition and hurriedly pitched the faulty round overboard. The forward gun, with Kayle's crew handling the antique 3-inch coolly and rapidly, fired once more before the 'scope disappeared. Both rounds missed by several yards.

Getsayev stepped back from the periscope, the lipless red gash of his mouth closed tightly. The tense eyes, expressing everything the destroyed facial muscles could not, sought and found Pyatnitsky's. "They're clear of the plane," he said. "Arm the torpedo. Prepare to fire." To the sub's helmsman, "Give me fifteen degrees left rudder."

Seconds ticked by. The submarine's crewmembers sat tensely, silently, at their stations; they were afraid to speak, afraid of the terrible hate-driven disfigured man who commanded them. The ballast control operator, a thin rabbitty-looking Ukrainian, made little nervous adjustments to the air

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manifold valve, keeping the sub at a constant depth. At last Pyatnitsky came back from the torpedo room. "It's ready, comrade captain."

"Get that 'scope up," snapped Getsayev, then grabbed it and wrestled it around. "There they are, the *vnebrachnii*. Helmsman, stand by . . . steady up. Can they hear me up forward, old man?"

"I opened all watertight doors, comrade captain, just shout loudly."

"What depth is the . . . wait . . . steady . . . FIRE," shouted Getsayev, and the sweating hull jolted as the single torpedo left its tube. The other men in the cramped compartment stopped breathing, watched his knuckles whiten on the handles of the periscope. Through the hull came a low, intermittent whine, which persisted for a quarter of a minute and then gradually faded into the silence of the ocean around them.

Very slowly Vselovod Nikolayevich took his face from the periscope eyepiece and turned to face Pyatnitsky, who was white and trembling, waiting for the blow.

"Directly underneath," said the captain softly. "What depth was it set for, comrade second officer?"

Before the old man could answer, the torpedoman, a blond kid of fifteen or sixteen, stumbled into the control room, looking scared. Getsayev rounded on him. "HOW DEEP?" he screamed, spittle flying into the boy's face.

"The book," said the boy, backing away from the enraged man. "Ten meters, the book says. Magnetic detonation. . . ."

"On a wooden hull?" screamed the captain. "You set it to pass underneath, for a wooden ship?", and with a backhand sweep of his arm he sent the boy crashing against the side of the hull, against the ballast control panel. Instantly, with a roaring hiss, the tanks began to blow, and the hull surged upward.

"*Torpedo*!" Masaryk had shouted, and the confusion of firing at a periscope had instantly given way to a disciplined response. But the ship was still gathering way, and it was evident to him that before the captain could get the bow around they would be hit.

Masaryk froze, one hand on the rail, while the other reached imploringly in the direction of the slow-moving trail on the blue sea. A bit of a childhood prayer, a remembrance of his dead parents flashed through his mind, and also a drill they had practiced during the long Atlantic crossing; he bent his knees to absorb the shock of the explosion. The torpedo was coming directly at him.

The torpedo passed underneath him. Masaryk turned his head from side to side and then his knees gave way and he found himself on the deck. "Oh, Christ," he whispered.

"There it is!" he heard Friesen's voice, and the pure malevolent hate in it brought him to his senses. Masaryk forced himself up and looked ahead. Just to port, almost directly ahead of

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the ship, a black bulk wallowed in the cobalt blue of the sea. The *San Francisco* rolled as she caught the wind, and the boy reached for a line to steady himself.

"She's too close!" he heard Kayle cry from the forward gun. The captain only nodded, and Masaryk saw the lined face set in a kind of tense joy. The captain was looking straight ahead.

"Ram her," he heard Friesen say to the helmsman.

"Ram her, aye." The wheel creaked, and the ship, now speeding along before the freshing wind, heeled a little more as the bow swung left and then steadied, aimed dead on the sub's midships. A whirring sound came from overhead, and Masaryk looked up unthinkingly, to see a small hole appear in the sail.

"They're shooting back," Chief Halloran shouted, and only then did Masaryk hear the tat-tat of small arms fire floating across the rapidly narrowing stretch of water. He ran forward, raising his automatic, eager to strike back; but as he passed Friesen the captain halted him with an iron grip on his arm. The older man pointed down the companionway. "A rifle would be better, John," he said. "Go below and get one."

"But by then we'll be. . . ."

For a second he and the captain were face to face, and for that second the mask relaxed and something like kindness passed over Friesen's face. "Get below, boy," he whispered, and with a powerful shove sent the ensign stumbling down the ladder.

Masaryk fell painfully, but was staggering up again at the bottom of the ladder when a terrible shock tore the handrails from his grasp and bloodied his face against the unyielding wooden steps. From the wheelhouse above came sharp cracking sounds, and a cascade of splinters came down the ladder.

When he gained the deck again Masaryk gasped, steadied himself against the bullet-scarred rail.

The *San Francisco's* bow was tilted high into the air, and on either side of it the waves lapped sluggishly over the black cylinder of the submarine. No . . . not on either side. At each lap of the seas, one end of the long shape was sinking lower into the water. Masaryk started forward, then stumbled.

It was Friesen, lying face down on the deck of the bullet-pocked wheelhouse. He did not move, even when Masaryk rolled him over. A dark patch of blood stained the holystoned wood of the deck.

"Bear a hand, somebody," came Chief Halloran's voice from the bow. Masaryk left the captain and ran forward. The chief, arms straining, was pulling one of the Russian sailors up from the canting deck of the sub's conning tower. Masaryk joined him, got a hand on the man's belt, and together they hauled him over the rail as, below them, the submarine made a slow half-roll and disappeared beneath the translucent Black Sea.

The Russian, an old man, watched the swirl of water where the boat had

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been, then turned and saluted them awkwardly.

"Name?" said Masaryk, groping for the right Russian word. *"Familia?"*

"Pyatnitsky," said the Russian.

Masaryk looked around for Kayle to ask him what to do about the Russian. The weapons officer was not on deck. "Where's Mr. Kayle, Chief?" he asked Halloran.

Halloran grunted, pointed to the companionway with his cigar. "I had him carried below, Ensign. Someone was firing a machine gun from the conning tower just as we hit them. A burst caught him in the chest. Just like the captain—he wouldn't take cover."

A horrible apprehension came to Masaryk's mind. He walked back to the wheelhouse. The captain was still there. But the ship's corpsman was just drawing a sheet over his face.

"He's dead," said Halloran, just behind him. "It's yours now, I guess—captain."

Ensign John Masaryk, aged seventeen, swallowed hard. "Mine? I mean—"

"You've got it," said the chief, and he and the old Russian—who had followed the chief up the deck—looked intently at the boy. "The ship—and the bombs."

Masaryk swallowed again. He looked down at the water, where a few pieces of floating trash remained from the submarine. The *San Francisco* was not moving, he noted, then realized that it was not moving because he had not yet given orders for her to move. She drifted quietly in the short, choppy waves. Masaryk tried to force himself to think. The sub—his first duty must be to assure that it was finished. He swung on Halloran. "Chief, is that jury-rigged depth charge ready to drop?"

"It's ready," said Halloran, his face unreadable. "Want to drop it?"

"Yes," said Masaryk. "There—there may still be some of them alive in the sub. They may repair it. Stand by to drop on my command." He looked at the elderly Russian, who was looking over the side again, as if he could see to the stricken vessel at the bottom. "How about him? Think we should lock him up, Chief?"

They both looked at Pyatnitsky. "He looks harmless," said Halloran at last. He pulled a hand-rolled cigar from his shirt pocket and offered it to the Russian, who nodded in thanks and smiled a little. "He's not going anywhere, that's for sure. I'll keep an eye on him."

The two old sailors, Russian and American, walked aft, cigar smoke trailing away in the wind. Masaryk noticed the crew of the forward gun looking at him. Waiting for orders. "Secure from battle stations," he said. "Get the ship squared away. Lay the dead out for burial."

But before he attended to that, there was unfinished business on the floor of the Black Sea.

He was alone again at the 'window' in the ship's bottom. The forefoot had

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been sprung in the collision, and the water in the bilges surged over the Plexiglas with each roll of the ship. They would have to do some pumping, Masaryk thought, but they would get home all right.

"Stand by the depth charge," he called, and Halloran, on the deck above, relayed his order to the men who waited on the stern, ready to light the fuse and roll the weighted barrel of explosive overboard.

The long hulk of the submarine slowly came into view ahead of him. As the schooner coasted toward it Masaryk examined it carefully.

As he'd expected, it was beyond repair, even if any of the crew were still alive. The submarine lay motionless in the mud, motionless except for a streamer of black oil slowly spiraling up from the gaping hole the heavy oaken bow of the schooner had torn in the old hull. It had gone down so quickly; almost, he thought, as if it had no interior compartmentation, or as if all its watertight doors had been open.

There could be no one left alive. Masaryk thought of Friesen, and of how happy the captain would have been at this sight.

Somehow Masaryk did not feel so happy. He remembered the terror he had felt as he watched the torpedo track. The men in the submarine had felt the same terror as the *San Francisco* had bore down on them. And they had died, as had so many others in this war. How long, Masaryk wondered, would it go on? He had asked himself that question before, but always the answer had been dependent on the actions of someone else. Now things were abruptly different. Now he was in command.

The submarine had been left behind, had slipped silently underneath the wooden hull. Ahead, just over a muddy hillock, he caught sight of a dark vertical line. He squinted through the window, through the water; yes, it was the bomber's rudder; the ship would pass directly over it. Slowly they drew closer. They were almost over the aircraft; its broad wings spread beneath him, a thing of technological skill such as no country on Earth could build any more. A thing of silvery beauty, wrecked now, but with the seeds of death for men still in its belly. Masaryk reached a decision.

"Drop it," he shouted, and scrambled for the ladder.

"Drop!" called Halloran, and reached down to help him on deck.

Two old men, and one youngster, looked astern of the *San Francisco* as a column of white water slowly erupted from the blue sea. As it began to subside a deep rumble tickled the soles of their feet; the shock wave had arrived. The three men watched for a long time. At last the youngster turned away, and the two old men followed him with their eyes as he walked to the wheelhouse, past the two flag-draped stretchers laid out on deck.

"Set a course for home," said Masaryk. ■

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KILLING CHILDREN

A child must die to create an adult.
But knowledge does not soften pain.
Just the opposite!

ORSON SCOTT CARD

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He heard the door click open but did not turn away from the tall pile of soft plastic blocks he was building. Instead he sought among the blocks scattered on the warm floor an orange block. Orange was definitely required, since it helped make no pattern whatsoever.

"Link?" said an overfamiliar voice behind him, a strange familiar voice that, alone of all voices, could make him turn, startled. I killed her, he thought softly. She is *dead.*

But he turned around slowly and there, indeed, was his mother, flesh as well as voice, the slender, oh-so-delicious looking body (not forty-five! couldn't be forty-five!) and the immaculate clothing and the terror in her eyes.

"Link?" she asked.

"Hello, Mother," he said stupidly, his voice deep and slow. I sound like a mental cripple, he realized. But he did not repeat the words. He merely smiled at her (the light making her hair seem like a halo, the fabric of her blouse clinging slightly to the undercurve of her breast, no, mustn't notice that, must think instead of motherhood and filial devotion. Why isn't she dead? Was that, please God, the dream, and this the reality? Or is this vision why I'm in this place?) and a tear or two dazzled in his eyes, making it hard for him to see, and in the dimness he supposed for a moment that she was not blond, but brown-haired; but she had always been blond—

Seeing the tear and ignoring the continued madness in his dancing gaze, his mother held out her arms for a second, only a second, and then put her hands on her hips (note the way the point of her hips and the curve of her abdomen leave two slender depressions pointing downward, Link said to himself) and got an angry look, a hurt look on her face, and said, "What, don't I even get a hug from my boy?"

The words were the incantation required to get Link from the floor to his full 190 centimeters of height. He walked to her, reaching out his long arms for her—

"No—" she gurgled, pushing him away. "Don't—just a little kiss. Just a kiss."

She puckered for a childish kiss, and so he, too, puckered his lips and leaned down. At the last moment, however, she turned her head and he kissed her clumsily on the ear and hair.

"Oh, how wet," she said in her disgusted voice. She reached into her hipbag and pulled out a tissue, wiped her ear, laughing softly, "Clumsy, clumsy boy, Link, you always have been. . . ."

Link stood in confusion. And as so many times before, puzzled as to what to do next that would not earn a rebuke. He remained in that confusion, knowing that there was something that he ought to do, something that he must decide, but instead deciding nothing, only playing again and again the same loop of thought in the same childish mental voice in which

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he had always played it, "Mummy mad, mummy mad, mummy mad."

She watched him, her lips forming a sort of half-smile (note the natural gloss on the lips, she never painted, never had to, lips always just slightly moist, partly open, the tongue playing gentle love games with the teeth), unsure of what was happening.

"Link?" she said. "Link, don't you have a smile for Mother?"

And Link tried to remember how to smile. What did it feel like? There were muscles that must be pulled, and his face should feel tight—

"No!" she screamed, stepping back from him and encountering the closed door. She apparently had expected it to be open—as if this were not a mental hospital and patients were free to roam the corridors at will. She whirled and hammered on the door with her fists, shouting frantically, "Let me out of here!"

They let her out, the tall men with the pleasant smiles who also took Link to the bathroom five times a day because somehow he had forgotten to notice when he needed to. And as the door closed behind her, Link still stood, unable to decide what he should do, and wondering why his hands were stretched out in front of him, the hands set to grip something circular, something vertical and cylindrical, something, perhaps, the shape of a human throat.

In Doctor Hort's office, Mrs. Danol sat, poised and beautiful, distractingly so, and Hort wondered whether this was indeed the same woman who had wept in the attendants' arms only a few minutes before.

"All I care about is my son," she said. "He was gone, vanished for seven terrible, terrible months, and all I know now is that I've found him again and I want him home. With me!"

Hort sighed. "Mrs. Danol, Linkeree is criminally insane. This is a *government* facility, remember? He murdered a girl."

"She probably deserved it."

"She had supported him and cared for him for seven months, Mrs. Danol."

"She probably seduced him."

"They had a very active sex life, in which both were eager participants."

Mrs. Danol looked horrified. "Did my son tell you that?"

"No, the tenants downstairs told the police that."

"Hearsay, then."

"The government has a very limited budget on this planet, Mrs. Danol. Most people live in apartments where privacy is strictly impossible."

And Mrs. Danol shuddered, apparently in disgust at the plight of the poor wretches that huddled in the government compound in this benighted capital of this benighted colony.

"I wish I could leave here," she said.

"It would have been nice at one time," Hort answered. "Your son hates this world. Or, rather, more particularly, he hates what he has seen of this world."

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"Well, I can understand that. Those hideous wild people—and the people in the city aren't much better."

Hort was amused at her reverse democracy—she esteemed all persons her infinite inferiors, and therefore equal to each other. "Nevertheless, now Linkeree must stay here and we must attempt a cure."

"Oh, that's all I want for my boy. For him to be the sweet, loving child he used to be—I can't believe he really killed her!"

"There were seventeen witnesses to the strangling, two of them hospitalized when he turned on them after they pried him away from the corpse. He definitely killed her."

"But why," she said emotionally, her breasts heaving with passion in a way that amused Hort—he had known many such closet exhibitionists in his time. "Why would he kill her?"

"Because, Mrs. Danol, except for hair color and several years of age, she looked almost exactly like you."

Mrs. Danol sat upright. "My God, Doctor, you're joking!"

"Almost the only thing that Link has been consistent about since he arrived here is his firm belief that it was you that he killed."

"This is hideous. This is repulsive."

"Sometimes he weeps and says he's sorry, that he'll never do it again. Most of the time, however, he cackles rather gleefully about it, as if it were a game that he had, after many losses, finally won."

"Is this what passes for psychology on this godforsaken planet?"

"This is what passes for psychology on Capitol itself, Mrs. Danol. That is, you recall, where I got my degree. I assure you I have invented nothing." And dammit, he thought, why am I letting this woman put me on the defensive? "We thought that the fact of seeing you alive might have some effect on your son."

"He did try to strangle me."

"So you said. You also said you wanted him to come home with you. Is that really consistent?"

"I want you to cure him and send him home! Since his father died, whom else have I had to love?"

Yourself, Hort refrained from saying. My, but I'm getting judgmental.

The buzzer sounded and, relieved at the interruption, Hort pressed the pad that freed the door. It was Gram, the head nurse. He looked upset.

"It was time for Linkeree's toilet," he said, beginning, as usual, in the middle, "and he wasn't there. We've looked everywhere. He's not in the building."

Mrs. Danol gasped. "Not in the building!"

Hort said, "She's his mother," and Gram went on. "He climbed through the ceiling tiles and out the air conditioning system. We had no idea he was that strong."

"Oh, what a fine hospital!"

Hort was irritated. "Mrs. Danol, the quality of this hospital as a hospital is indisputably excellent. The quality of this hospital as a prison is woefully deficient. Take it up with the govern-

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ment." Defensive again, dammit. And the bitch is still throwing her chest at me. I'm beginning to understand Linkeree, I think. "Mrs. Danol, please wait here."

"No."

"Then go home. But I assure you you'll be entirely in the way while we search for your son."

She glared at him and stood her ground.

He merely nodded. "As you will," he said, and picked up the door control from the desk, carried it with him out of the room, and slid the door shut in Mrs. Danol's face as she tried to follow. He got an altogether unhealthy feeling of satisfaction at having done so.

"Wouldn't mind strangling her myself," he said to Gram, who missed the point and looked a bit worried. "A joke, Gram. I'm not getting homicidal. Where did the fellow go?"

Gram had no answer, and so they went outside to see.

Linkeree huddled against the fence of the government compound, the miles of heavy metal fencing that separated civilization from the rest of the world. The evening wind was already blowing in from the thick grass and rolling hills of the plain that gave the planet its name, Pampas. The sun was still two fingers off the horizon, however, and Linkeree knew that he was plainly visible from miles away. Visible both to the government people who would surely be looking for him; but also visible to the Vaqs, who he knew waited just over the hill, waiting for a child like him to wander out to be eaten.

No, he thought. I'm not a child.

He looked at his hands. They were large, strong—and yet unweathered, as sensitive and delicate as an artist's.

"You should be an artist," he heard Zad saying.

"Me?" Link answered, softly, a little amused at the suggestion.

"Yes, you," she said. "Look at this," and her hand swept around the room, and because he could not avoid following her hand, he also saw: Tapestries on tapestries on one wall, waiting to be sold. Another wall devoted to thick rugs and the huge loom that Zad used for her work. And another wall windowed ceiling to floor (glass is cheap, someone told the government architect), showing the shabbily identical government housing project in which most of the capital's people lived, and beyond them the Government Office Building from which the lives of thousands of people were run. Millions, if you counted the Vaqs. But no one counted them.

"No," Zad said, smiling. "Sweet, darling Link, look there. That wall."

And he looked and saw the drawings in pencil, the drawings in crayon, the drawings in chalk.

"You can do that."

"I'm all thumbs." Oh, you're all thumbs, he remembered his mother saying.

Zad took his hands and put them around her waist. "Not *all* thumbs," she said, giggling.

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And so he had reached out, held the charcoal, and with her hand guiding his at first, had sketched a tree.

"Wonderful," she said.

He looked at the ground and saw that he had drawn a tree in the ground. He looked up and saw the fence. They're chasing me, he thought.

"I won't let them catch you," he remembered Zad saying. He was ashamed at having lied to her and told her he was a criminal. But how would she have treated him if she'd known he was only the reclusive son of Mrs. Danol, who owned most of Pampas that could be owned? Then she would have been shy of him. Instead, he was shy of her. She had taken him from the street where he was wandering that night, already having been mugged and beaten up—the mugging by one man, the beating by two others who had found his hipbag empty.

"What, are you crazy?"

He had shaken his head, but now he knew better. After all, hadn't he murdered his mother?

A siren went off in the mental hospital. With a wrenching sense of despair Linkeree curled up tighter in a ball, wishing that he could turn into a bush. But that wouldn't help, would it? This is a defoliated area.

"What have you drawn?" he remembered Zad asking, and he wept.

A stinger stung him, and he flicked the insect from his hand. The pain brought him up short. What was he doing?

"What am I doing?" he thought. Then he remembered the escape from the mental hospital, the run through the maze of buildings to the perimeter—the perimeter, because it was safety, the only hope. He vaguely recalled his childhood fear of the open plain—his mother's horrid stories of how the Vaqs would get you if you weren't good and didn't eat your supper.

"Don't disobey me again, or I'll let the Vaqs at you. And you know what part of little boys they like to eat first."

What a sick lady, Linkeree thought for the millionth time. At least it isn't hereditary.

But it is, isn't it? Aren't I escaping from a mental hospital?

He was confused. But he knew that over the fence was safety, Vaqs or no Vaqs; he couldn't stay at the hospital. Hadn't he killed his mother? Hadn't he told them he was glad of it? And when they realized he wasn't insane at all, that he really, seriously, in cold blood strangled his mother on the public streets of Pampas City, without benefit of madness—well, they'd kill him.

I will not die at their hands.

The barbed wire scratched him unmercifully, and the electric shock from the top wire would have stunned a cow, he thought. But grimly he hung on, his body shuddering in the force of the voltage; climbed over; dangled a moment on the barbs until his shirt ripped apart and let him drop; then lay, stunned, on the ground as another alarm went off, this time nearby.

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I've told them where I am, he thought. What an ass.

So he stood, his body still trembling from the electricity, and staggered stupidly off into the high grass that began crisply a hundred meters from the fence.

The sun was touching the horizon.

The grass was harsh and sharp.

The wind was bitterly cold.

He had no shirt.

I will freeze to death out here tonight. I will die of exposure. And the part of him that always gloated sneered, "You deserve it, matricide. You deserve it, Oedipus."

No, you've got it all wrong, it's the father you're supposed to kill, right?

"Why, it's a painting of me, isn't it?" asked Zad, seeing what he had done with the watercolors. "It's excellent, except that I'm not blond, you know."

And he looked at her and wondered, for a moment, why he had thought she was.

He was snapped out of his memory by a sound. He could not identify it, nor even, for sure, the direction from which it had come. He stopped, stood still, listening. Now, aware of where he was, he realized that his arms and hands and stomach and back were scratched and slightly bloody from the rasping grass. The suckers were clinging to his bare body; he brushed them away with a shudder of revulsion. Bloated, they dropped—one of the curses of the planet, since they left no itch or other pain, and a man could bleed to death without knowing he was even being sucked.

Linkeree turned around and looked back. The lights of the government compound winked behind him. The sun had set, and dusk was only dimly lighting the plain.

The sound came again. He still couldn't identify it, but now the direction was more distinct—he followed.

Not two meters off was a feebly crying infant, the mucus of birth still clinging to his body, the afterbirth unceremoniously dumped beside him. The placenta was covered with suckers. So was the baby.

Linkeree knelt, brushed away the suckers, looked at the child, whose stubby arms and legs proclaimed him to be a Vaq. Yet apart from that, Link could see no other sign that this was not a human infant—the dark skin must come after years of exposure to the hot noon sunshine. He remembered clearly that one of the long line of tutors he had studied with had told him about this Vaq custom. It was assumed to be the exact counterpart of the ancient Greek custom of exposing unwanted infants, to keep the population at acceptable levels. The baby cried. And Linkeree was struck bitterly with the unfairness that it was *this* infant that was chosen to die for the good of the—tribe? Did Vaqs travel in tribes? If seven percent of infants had to die for the good of the tribe, why couldn't there be a way for seven-hundredths of each child to be done away? Impossible, of course. Linkeree stroked the child's feeble arms. It was much more efficient to rid the world

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of unwelcome children.

He picked up the infant, gingerly (he had never done so before, only seen them in the incubators in the hospital his father had built and which, therefore, Linkeree was "responsible" for), and held it against his bare chest, wondering at the warmth it still had. For a moment at least the crying stopped, and Link periodically struck off the suckers that leaped from the placenta to the baby's or his bare skin.

We are kin, he told the child silently, we are kin, the unwanted children. "If only you'd never been born," he heard his mother saying; this time a saying she had said only once, but the memory was sharp and clear, the moment forever imprinted on his mind. It was no act. It was no sham, like her hugs and kisses and I'm-so-proud-of-*yous*. It was a moment, all too rare, of utter sincerity: "If only you'd never been born, I wouldn't be getting old like this on this hideous planet!"

Why, then, mother, didn't you leave me on the plain to die? Much kinder, much, much kinder than to have kept me at home, killing me seven percent at a time.

The baby cried again, hunting for a breast that by now was surely many kilometers off, leaking pap for the child that would never suckle. Did the mother grieve, perhaps? Or was she only irritated at the sensitivity of her breasts, only anxious for the last remnants of the pregnancy to fade?

Squatting there, holding the infant, Linkeree wondered what he should do. Could he bring the child back into the compound? Unquestionably yes, but at a cost. First, Linkeree would then be caught, would then be reconfined to the hospital where the fact that he was not, was *not* insane would soon be discovered and they would cleanly and kindly push the needle into his buttocks and put him irrevocably to sleep. And then there was the child. What would they do with a Vaq child in the capital? In an orphanage it would be tortured by the other children who, in their poverty and usual bastardy would welcome the nonhuman as something lower that they could torment and so prove their power. In the schools, the child would be treated as an intellectual pariah, incapable of learning. It would be shunted from institution to institution—until someday on the street the torment became too much and he strangled somebody and then died for it. . . .

Linkeree laid the baby back down. If your own don't want you, the stranger doesn't want you, either, he

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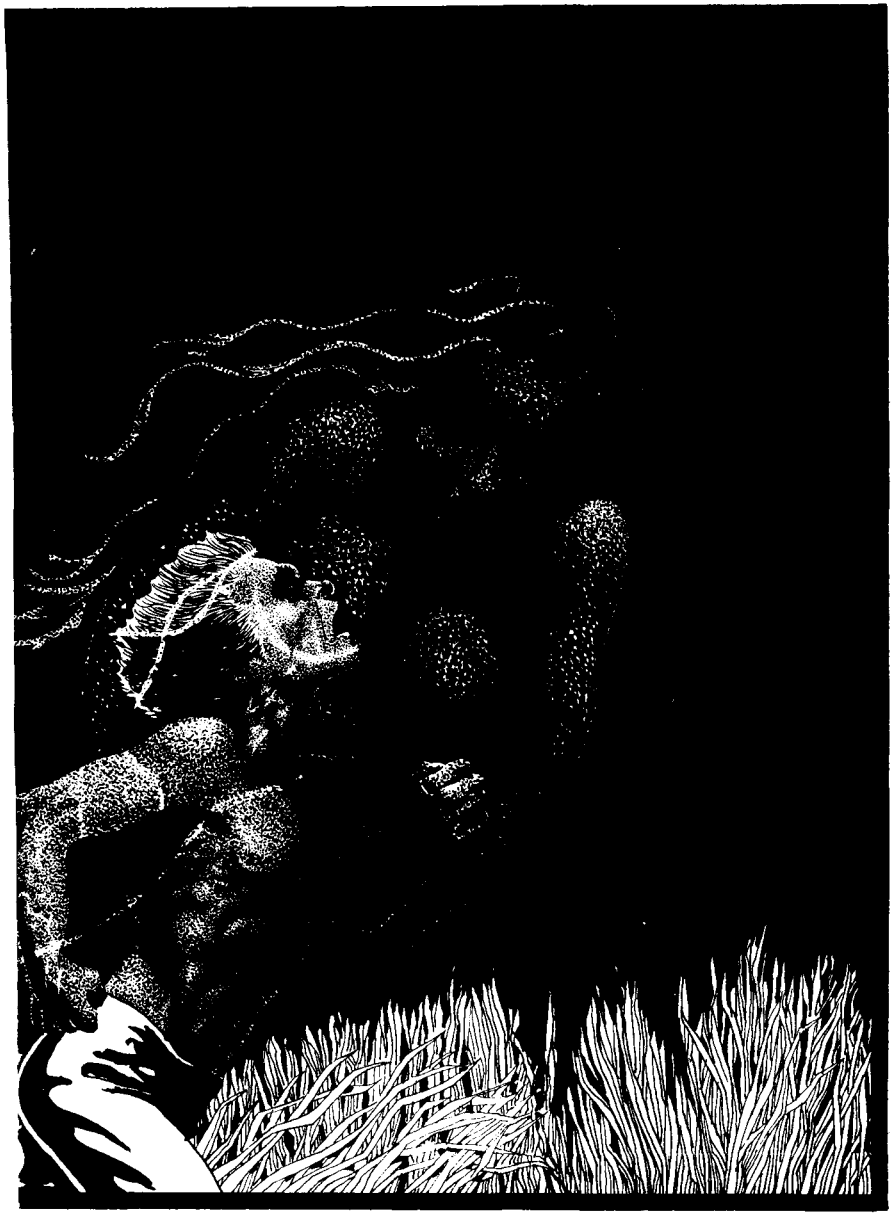

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said silently. The baby cried desperately. Die, child, Linkeree thought, and be spared. "There's not one damn thing I can do," he said aloud.

"What do you mean, when you can paint like that?" Zad answered. But Link saw more clearly than she. He had meant to paint Zad, but had instead painted his mother. Now he saw what for seven months he had been blind to—Zad's resemblance to his mother. That's why he had followed her through the streets that first night, had kept watching her, until finally she had asked him what the hell—

"What the hell?" Zad asked, but Link didn't answer, only wrinkled up the painting clumsily (You're all thumbs, Linky!), pressed the wad against his crotch, and struck the paper and thus himself viciously once. Cried out in agony. Struck himself again.

"Hey! Hey, stop that! Don't—"

And then he saw, felt, smelled, heard his mother lean over him, her hair brushing his face (sweet-smelling hair), and Link was filled with the old helpless fury, a helplessness made worse by clear memories of love-making hour after hour with this woman in an apartment filled with paintings in a government flat in the low part of the city. Now I'm grown up, he thought, now I'm stronger than her, and still she controls me, still she attacks me, still she expects so damn *much* and I never know what I should do! And so he stopped striking himself and found a better target.

The baby was still crying. Link was disoriented for a moment, wondering why he was trembling. Then another gust of wind reminded him that tonight was the night he would die in feeble expiation for his sins, he like the baby sucked dry by tiny bites, gnawed to death by the chewers that padded through the night, frozen to death by the wind. The difference would be, of course, that the infant would not understand, would never have understood. Better to die unknowing. Better to have no memories. Better to have no pain.

And Link reached down and put his thumb and forefinger around the baby's throat, to kill it now and spare it the brief agony of death later in the night. But when it was time to squeeze tightly and shut off blood and breath, Link discovered that he could not.

"I am not a killer," Link said. "I can't help you."

And he got up and walked away, leaving behind the child's mewling to be buried in the noise of the wind pushing through the grass. The blades rasped against his naked chest, and he remembered his mother scrubbing him in the bath. "See? Only I can reach your back. You need me, just to stay clean."

I need you.

"That's mother's good boy."

Yes. I am, I am.

"Don't touch me! I won't have any man touch me!"

But you said—

"I'm through with men. You're a bastard and a son of a bastard and

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you've made me old!"

But Mother—

"No, no, what am I doing? It isn't *your* fault that men are like that. You're different, you my sweet little boy, give Mother a hug—not so *tight*, for God's sake, you little devil, what are you trying to do? Go to your room!"

He stumbled in the near darkness and fell, cutting his wrist in the grass.

"Why are you hitting me?" he heard the brown-haired woman who ought to be blond crying out. But he hit her again, and she fled the apartment, ran down the stairs, stumbled out into the street. It was the stumbling that let him catch her, and there in the middle of the road he stifled her scream by showing her precisely what a man was like, by throwing her at long, long last away.

A knife pricked into his chest.

He looked up from where he lay in the grass at a short, stocky man—no, not a man, a Vaq—and not just one, a half dozen, all armed, though some were just rising from the ground and still seemed half asleep. He had stumbled in his daze into a Vaq camping place.

This is better, he thought, than the suckers and chewers, and so with a pillar of blackness and chill in place of his spine, he weakly stood, waiting for the knife.

But the knife pressed no deeper toward his heart, and he grew impatient. Wasn't he the heir of the man who had done most to hurt the Vaqs, whose great tractors had swept away the livelihood of a dozen tribes, whose hunters had killed Vaqs who chanced to wander on land marked out as his? I am the owner of half this world that is worth owning; kill me and free yourselves.

One of the Vaqs hissed impatiently. Press the knife, Link thought he seemed to say. And so he, too, hissed. Impatiently. Act now. Hurry.

In surprise at his having echoed his own death sentence, the Vaq with the knife at his chest withdrew a step, though he still held out the knife, pointing at Linkeree. The Vaq babbled something, something ripe with rolled *R*s and hissed *S*s—not a human language, they taught the children in the government schools, even though as Link well knew there were dozens of anthropological reports pointing out that the Vaq language was merely corrupted Spanish, and the Vaqs were obviously the descendants of the colony ship *Argentine* that had been thought lost in the first decade of interstellar colonization thousands of years ago, when man had first reached out from the small planet that they had utterly spoiled. Human. Definitely human, however cruel Pampas had selected for ugliness and ignorance and viciousness and inhumanity.

Savages have no monopoly on that.

And Linkeree reached out, gently took the hand that held the blade, and guided it back until the point pressed against his belly. Then he hissed again, impatiently.

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The Vaq's eyes widened, and he turned to look at his fellows, who were equally puzzled. They babbled; some backed away from Link, apparently in fear. Link couldn't understand. He guided the knife deeper into his flesh; blood crept back along the horizontal blade.

The Vaq withdrew his knife, abruptly, and his eyes filled with tears, and he knelt and took Linkeree by the hand.

Link tried to pull his hand away. The Vaq only followed, offering no resistance. The others, also, gathered around. He couldn't understand their language, but he could understand the gestures. They were, he realized, worshiping him.

Gentle hands led him to the center of the encampment. All around, little braziers of peat burned brightly, sizzling constantly as the heat-seaking suckers left the Vaqs and gathered to die in the fire.

They sang to him, plaintive melodies that were only deepened and enhanced by the sweep and howl of the wind. They stripped him and touched him all over, gently exploring, then dressed him again and fed him (and he thought bitterly of the child who, because of the lack of food, was even now dying in the grass) and surrounded him and lay down around him to protect him as he slept.

You're cheating me. I came here to die, and you're cheating me.

And he wept bitterly, and they admired his tears, and after a half hour, long before the cold moon rose, he slept, feeling cheated but somehow utterly at peace.

Mrs. Danol sat in a chair in Hort's office, her arms folded tightly, her eyes savagely watching every move he made—or didn't make.

"Mrs. Danol," he finally said, "it would help everyone, including you, if you went home."

"Not," she answered acidly, "until you find my boy."

"Mrs. Danol, we are not even looking!"

"And that's why I'm not leaving."

"The government doesn't send searchers out on the plains in the nighttime. It's suicidal."

"And so Linkeree is going to die. I assure you, Mr. Hort, that the hospital will regret not doing anything."

He sighed. He was sure that the hospital would—the annual gifts from the Danol family were more than half of the operating budget. Some salaries would go immediately—primarily his, there was little doubt. And so, knowing that, and also because he was extremely tired, he tossed aside his politic courtesy and pointed out some blunt facts.

"Mrs. Danol, are you aware that in ninety percent of our cases, treating the patient's parents is the most effective step toward a cure?"

Her mouth grew tight and hard.

"And are you aware that your son is not genuinely psychotic at all?"

At that she laughed. "Good. All the more reason to get him away from here—if he lives through this night

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out there in that hell that passes for a terraformed planet."

"Actually, your son is quite sane, half the time—a very intelligent, very creative young man. Very much like his father." That last was intended as a very deep dig. It worked.

She rose from her chair. "I don't want any mention of that son-of-a-bitch!"

"But the other half of the time, he is merely reenacting childhood. Children are insane, all of them—by adult standards. Their defense strategies, their adaptations, are all such that an adult using them is regarded as utterly mad. Paranoia, acting out, denial, self-destruction. For some reason, Mrs. Danol, your son has been kept penned into the relationship structures of his childhood."

"And you think the reason is me."

"Actually, it's not just a matter of opinion. The only times that Linkeree was sane were the times when he believed he had killed you. Believing you dead, he functions as an adult. Believing you alive, he functions as an infant."

He had gone too far. She shouted in rage and struck out at him across the desk. Her fingers raked his face; her other hand sprawled along his desk, shoving papers and books off onto the floor. He managed to push the call button while he grappled with her with his other hand. But he had lost a handful of hair and gained bruises in his shins by the time the attendants came in and held her back, sedated her, took her to a room to rest.

Morning. The hairy birds of the plains were awake, foraging briskly in the dawn, eating the now sluggish suckers that had bloated themselves on the night life of the grasslands. Linkeree woke, mildly surprised at how natural and good it felt to awaken in the open, lying on a mat of grass, with birds crying. Is there some racial memory of life in the open land that makes me feel so comfortable? he wondered. But he yawned, stood, stretched, feeling vigorously alive, feeling good.

The Vaqs watched him, even as they pursued their morning tasks—packing up for the day's journey, fixing a skimpy breakfast of cold meat and hot water. But after the eating, they came to him, touched him again, knelt again, making arcane signs with their hands. When they were through (and Linkeree thought bitterly that it was strange that murder and worship were the only intercourse men could have with the Vaqs) they led Linkeree out of the camp, back in the direction he had come last night.

Now, in daylight, he could see why it was that the Vaqs were such deadly adversaries when met in their native habitat. They were short, and not one of them stood taller than the thickest part of the grass, though Link, not a tall man by any human standard, could see clearly over the crest of the blades. And the grass ate up their footprints, closed behind them, hid their movements from any possible observer or follower. An army of Vaqs could

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pass by unnoticed a meter from the keenest observer, he thought, with some exaggeration.

And then they arrived. They had brought him back to where the baby had been abandoned. It shocked Linkeree profoundly, that they would return to the scene of their crime. Was there no shame to the murders? At least they could have the decency to forget the existence of the child, instead of coming back to gloat.

But they formed a circle around the small corpse (how had they found him again in the grass?) and Linkeree looked down at the child's body.

A chewer had come in the night, and then several others. The first had (shades of Mother's nighttime threats) chewed off the infant genitals, gnawed into the abdomen at the soft entrails, ignoring the muscle tissue entirely. But the baby and the placenta had attracted a huge concentration of suckers, and these had eagerly transferred to the much warmer chewer, bleeding it to death before its meal was finished. The later chewers were bled to death even faster, as more and more suckers came, sucked, laid eggs, and died.

And then the birds, which had danced skyward when Link and the Vaqs had arrived, eating the dying suckers, but ignoring the sucker eggs which were implanted on the blades of grass, where tonight they would hatch, and the lucky ones would find food before they starved to death, find food and reproduce in a mad, one-night life.

Except for the gnawed away crotch, the child's body was intact.

The Vaqs knelt, nodded toward Link, and began cutting up the child's body. The incisions were neat, precise. Breastbone to crotch, a *U*-shaped cut around the breasts, a long slice down the arms, the head completely removed; all cuts were quick and deft, and in a moment the body was entirely skinned.

And then they ate.

Link watched, appalled, as they each in turn lifted a strip of raw meat toward him, as if it were a votive offering. He shook his head each time, and each time the Vaq murmured (in thanks) and ate.

And when the raw bones were left, and the skin, and the head, the Vaqs opened the skin smoothside up and laid it before Link. They picked up the pile of bones, and held it out to him. He took them—he was afraid, in the face of such inhumanity, to refuse. Then they waited.

What do I do now? he wondered.

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They were beginning to look a bit disturbed as he knelt, motionless, with the bones in his hands. And so, vaguely remembering some of his classical history, he tossed down the bones onto the blanket of skin and then stood, wiping the blood off his hands onto his trousers.

The Vaqs all looked at the bones, pointing to this one and that one, though they had landed in no pattern discernible to Link. At last, however, they began to grin, to laugh, to jump up and down and jig in delight at whatever the bones had told them.

Linkeree was more than a little glad that the portents had turned out so well. What would they have done if the bones had somehow spelled disaster?

The Vaqs decided to reward him. They picked up the head and offered it to him.

He refused.

They looked puzzled. So did he. Was he supposed to eat the head? It was ghastly—the stump had not bled at all, looked like a laboratory specimen, reminded him of—

No, he would not.

But the Vaqs were not angry. They seemed to understand—they only took the bones, buried each in a separate but shallow hole scrabbled out of the rich deep soil under the grass, and then took the skin and draped it over Link's bare shoulders. It occurred to him that they were signifying that *he* was the child. The leader's gesture confirmed that they believed that—he kept gesturing from the skin and the head to Linkeree, and then pausing, waiting for an answer.

Linkeree didn't know how to respond. If he denied he was the child's spirit or successor or something, would they kill him? Of if he admitted that he was, would they finish their sacrifice by killing him? Either choice might end his life, and he was not feeling suicidal this morning.

And then, as he stared into the child's dead face, remembering that last night the infant had been alive, had responded to his touch, he realized that there was more truth than they realized to their belief. Yes, he was the infant, chewed and cut and eaten and cast away to be buried in a hundred tiny graves. Yes, he was dead. And he nodded in acceptance, nodded in agreement.

The Vaqs all nodded, too, and one by one they came to him and kissed him. He was unsure of whether the kiss was a prelude to leaving or to killing; but then they each kissed the child's head that he held in his hands in front of him, and as he saw their lips tenderly rest on the infant forehead or cheeks or mouth he was overcome by self-pity and grief; he wept.

And, seeing his tears, the Vaqs grew afraid, babbled quietly among themselves, and then disappeared silently into the tall grass, leaving Linkeree alone with the child's relics.

Dr. Hort went to see Mrs. Danol as soon as he woke up in the morning. She was sitting in one of the empty private rooms, her hands folded in her

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lap. He knocked. She looked up, saw him through the window, nodded, and he came in.

"Good morning," he said to her.

"Is it?" she answered. "My son is dead by now, Dr. Hort."

"Perhaps not. He wouldn't be the first to survive a night in the grass, Mrs. Danol."

She only shook her head.

"I'm sorry about last night's fracas," he said. "I was tired."

"You were also too damn right," she answered. "I woke up at four this morning, sedative or no sedative. I thought and thought about it. I'm poison. I've poisoned my son just by being his mother. I wish I could be out there on the plain in his place, dying for him."

"And what the hell good would that do?"

She only cried in answer. He waited. The sobbing let up only a few moments later.

"I'm sorry," she said. "I've been crying off and on all morning." Then she looked at Hort, pleading in her eyes, and said, "Help me."

He smiled—kindly, not triumphantly—and said, "I'll try. Why don't you just tell me what you've been thinking about?"

She laughed bitterly. "That's a rat's nest we hardly need to go into. I spent most of the time thinking about my husband."

"Whom you don't like."

"Whom I loathe. He married me because I wouldn't sleep with him otherwise. He slept with me until I got pregnant; then he moved on. When Linkeree turned out to be a boy, he was delighted, and changed his will to leave everything to the boy. Nothing to me. And when, after he had slept with every girl on this planet and half the boys, he was run over by a tractor and I gave a little cheer."

"He was well thought of on the planet."

"People always think well of money."

"They often think well of beauty, too."

And at that she cried again. Through her sobs, in a twisted, little-girl voice, she said, "All I ever wanted was to go to Capitol. To go to Capitol and meet all the famous people and be on somec so that I could live forever and be beautiful forever. It's all I had, being beautiful—I had no money, no education, and no talent for anything, not even motherhood. Do you know what it means to have only one thing that makes other people love you?"

No, Hort thought to himself, but I can see what a tragedy it is.

"You were your son's guardian. You could have taken him to Capitol."

"No, I couldn't. It's the law, Hort. Planet money must be invested on the planet until it achieves full provincial status. It protects us from *exploitation*!" She spat the word. "No somec allowed until we're a province. No chance to have *life*!"

"There are some of us who don't want to sleep for years on end, just to stay young a few years longer," Dr.

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Hort said reassuringly.

"Then you're the insane ones," she retorted, and he almost agreed. Eternal life didn't appeal to him. Sleeping through life seemed like a disgusting waste of time. But he knew the draw, knew that most people who came to the colonies were desperate or stupid, that the gifted ones or the rich ones or the hopeful ones stayed where somec was within reach.

"Not only that," she said, "my damnable husband entailed the entire fortune, everything. Not a penny could be taken from Pampas."

"Oh."

"So I stayed, hoping that when my son grew up we could find some way, go anyway—"

"If your son hadn't been born, the money would all have been left to you, unentailed, and you could have sold it to an offworlder and gone."

She nodded, and began to weep again.

"No wonder you hated your son."

"Chains. Chains, holding me here, stripping away my only asset as the years made hash of my face and my figure."

"You're still beautiful."

"I'm forty-five years old. It's too late. Even if I left for Capitol today, they won't let someone over forty-five go on somec at all. It's the law."

"I know. So—"

"So stay here and make the best of it? Thanks, Doctor, thanks. I might as well have a priest as you."

She turned away from him, and muttered, "And now the boy dies. *Now*, when it's too late. Why the bloody hell couldn't he have died a year ago?"

Linkeree patted the last of the earth over the grave he had dug for the head and skin of the child. The tears had long since dried; now the only liquid on him was sweat from the exertion in the hot sun of digging through the heavy roots of the grass. No wonder the Vaqs had dug shallowly to hide the bones. It was already afternoon, and he had only just finished.

But as he had worked, he had forced himself back, coldly reassembling his memories in his mind, burying them one by one in the child's grave. It was not Mother I killed in the street, it was Zad. Mother is still alive; she visited me yesterday. That was why I fled the hospital; that was why I wanted to die. Because if ever there was a person who deserved to live, it was Zad. And if ever one deserved to die, it was Mother.

Several times he felt himself longing to curl up and hide, to retreat into the cool shade under the standing grass, to deny that any of this had ever happened, to deny that he had ever turned five at all. But he fought off the feeling, insisted on the facts, the whole history of his life, and then hid it under the dirt.

You, child, he thought. I am you. I came out here last night to die in the grassland, to be eaten alive, to have my blood sucked out. And it happened; and the Vaqs ate my flesh and now I'm buried.

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I who bury you, child, I am the you who might have been. I am without a past. I have only a future. I will start from here, without a mother, without blood on my hands, rejected by my own tribe and unacceptable to strangers. I will live among the strangers anyway, and live unencumbered. I will be you, and therefore I will be free.

He brushed the dirt off his hands, ignored the painful sunburn on his back, and stood. Around him the sucker eggs on the grassblades were already hatching, and the newborn suckers were devotedly eating each other so that only the few thousand strongest would survive, fed by the others. Link avoided obvious comparisons, merely turned and headed back toward the government compound.

He avoided the gate, instead climbing the fence and enduring the electricity that coursed through him when he gripped the top wire. And then, as the alarms went off, he walked back to the hospital.

Dr. Hort was alone in his office, eating a late lunch from a tray that Gram had brought him. Someone tapped at his door. He opened it, and Linkeree walked in.

Hort was surprised, but out of long professional habit, he didn't show it. Instead, he dispassionately watched as Linkeree walked to the chair, sat down comfortably, and leaned back with a sigh.

"Welcome back," Hort said.

"Hope I didn't cause any inconvenience." Linkeree answered.

"How was your night in the grass?"

Linkeree looked down at his scratches and scabs. "Painful. But therapeutic."

Silence for a moment. Hort took another bite of his sandwich.

"Dr. Hort, right now I'm in control. I know that my mother's alive. I know that I killed Zad. I also know that I was insane when I did it. But I understand and I accept those things."

Hort nodded.

"I believe, Doctor, that I am sane right now. I believe that I am viewing the world as accurately as most people, and can function in a capable manner. Except."

"Except?"

"Except that I'm Linkeree Danol, and as soon as it is known that I am capable of running things, I will be forced to take control of a very large fortune and a huge business that employs, in the long run, most of the people on Pampas. I will have to live in a certain house in this city. And in that house will be my mother."

"Ah."

"I don't believe my sanity would last fifteen minutes, Doctor, if I had to live with her again."

"She's changed somewhat," Dr. Hort said. "I understand her a little now."

"I have understood her completely for years, and she'll never change, Dr. Hort. More important, though, is the fact that *I'll* never change when I'm around her."

Hort sucked in a deep breath,

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leaned back in his chair. "What happened to you out on the desert?"

Linkeree smiled wanly. "I died and buried myself. I can't return to that life. And if it means staying here in this institution all my life, pretending to be insane, I'll do that. But I'll never go back to Mother. If I did that, I'd have to live with all that I've hated all my life—and with the fact that I killed the only person I ever loved. It isn't a pleasant memory. My sanity is not a pleasant thing to hold onto."

Dr. Hort nodded.

There was a knock at the door. Link straightened up. "Who is it?" Hort asked.

"Me. Mrs. Danol."

Linkeree stood up abruptly, walked around the office to a point at the far wall from the door.

"I'm consulting, Mrs. Danol."

Her voice was strident, even through the muffling door. "They told me Linkeree had come back. I heard you talking to him in there."

"Go away, Mrs. Danol," Dr. Hort said. "You will see your son in due time."

"I will see him now. I have a writ that says I can see him. I got it from the court at noon. I want to see him."

Hort turned to Link. "She thinks ahead, doesn't she?"

Link was shaking. "If she comes in, I'll kill her."

"All right, Mrs. Danol. Just a moment."

"No!" Link shouted, making spastic motions as if he wanted to claw his way through the wall backward.

Hort whispered, "Relax, Link. I won't let her near you." Hort opened a closet—Link started to walk in it. "No, Link." And Hort took his spare suit off the hanger, and a clean shirt. The suit, in the standard one piece, was a little long for Linkeree, but the waist and shoulders were not far wrong, and Link didn't look out of place in it when he had finished dressing.

"I don't know what you hope to gain by stalling, Mr. Hort, but I will see my son," Mrs. Danol shouted. "In three minutes I'll call the police!"

Hort shouted back, "Patience, Mrs. Danol. It takes a moment to prepare your son to see you."

"Nonsense! My son wants to see me!"

Linkeree was trembling, hard. Hort put his arms around the young man, gripped him tight. "Keep control," he whispered.

"I'm trying," Link chattered back, his lower jaw out of control.

Hort reached into his hipbag, pulled out his ID and his cred, and handed them to Link. "I won't report them missing until you are on a ship out of here."

"Ship?"

"Go to Capitol. You'll have little trouble there, finding a place. Even without money. There's always room for someone like you."

Link snorted. "That's a damn lie and you know it."

"Right. But even if they send you back here, your mother will be dead by then."

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Linkeree nodded.

"Now here's the door control. When I say, open the door."

"No."

"Open the door and let her in. I'll keep her under control until you get out the door and close it from the outside. There's no way out of here, then, except Gram's masterkey, and this note should take care of that." Hort scribbled a quick note. "He'll cooperate because he hates your mother almost as much as I do. Which is a terrible thing for an impartial psychologist to say, but at this point, who the hell cares?"

Linkeree took the note and the door control and stood beside the door with his back to the wall. "Doctor," he asked, "what'll they do to you for this?"

"Raise holy hell, of course," he said. "But I can only be removed by a council of medical practitioners—and that's the same group that can have Mrs. Danol committed."

"Committed?"

"She needs help, Link."

Linkeree smiled—and was surprised to realize it was his first smile in months. Since. Since Zad died.

He touched the open button.

The door slid open and Mrs. Danol swept in. "I knew you'd see reason," she pronounced, then whirled to look as Link stepped out the door, closing it so quickly that he almost got caught in it. His mother was already screaming and pounding as Link handed the note to Gram, who read it, looked closely at the man, and then nodded. "But hurry your ass, boy," Gram said. "What we're doing here is called kidnapping in some courts."

Linkeree set the door control on the desk and left, running.

He lay in the ship's passenger hold, recovering from the dizziness that they told him was normal with a person's first mindtaping. The brain patterns that held all his memories and all his personality were now in a cassette securely stored in the ship's cabin, and now he lay on a table waiting for them to drug him with somec, the magical medicine that had made interstellar travel possible by slowing all body activities to an infinitesimal crawl, at the cost of wiping out the mind and memory of the sleeper. When he woke up and had his memory played back into his mind in Capitol, he would only remember up to the moment of taping. These moments now, between the tape and the tap, would be lost forever.

And that was why he thought back to the infant whose warm body he had held, and why he let himself wish that he could have saved him, could have protected him, could have let him live.

No, I'm living for him.

The hell I am. I'm living for me.

They came and put the needle into his buttocks, not for the cold sleep of death, but for the burning sleep of life. And as the hot agony of somec swept over him, he writhed into a ball on the table and cried out, "Mother! I love you." ■

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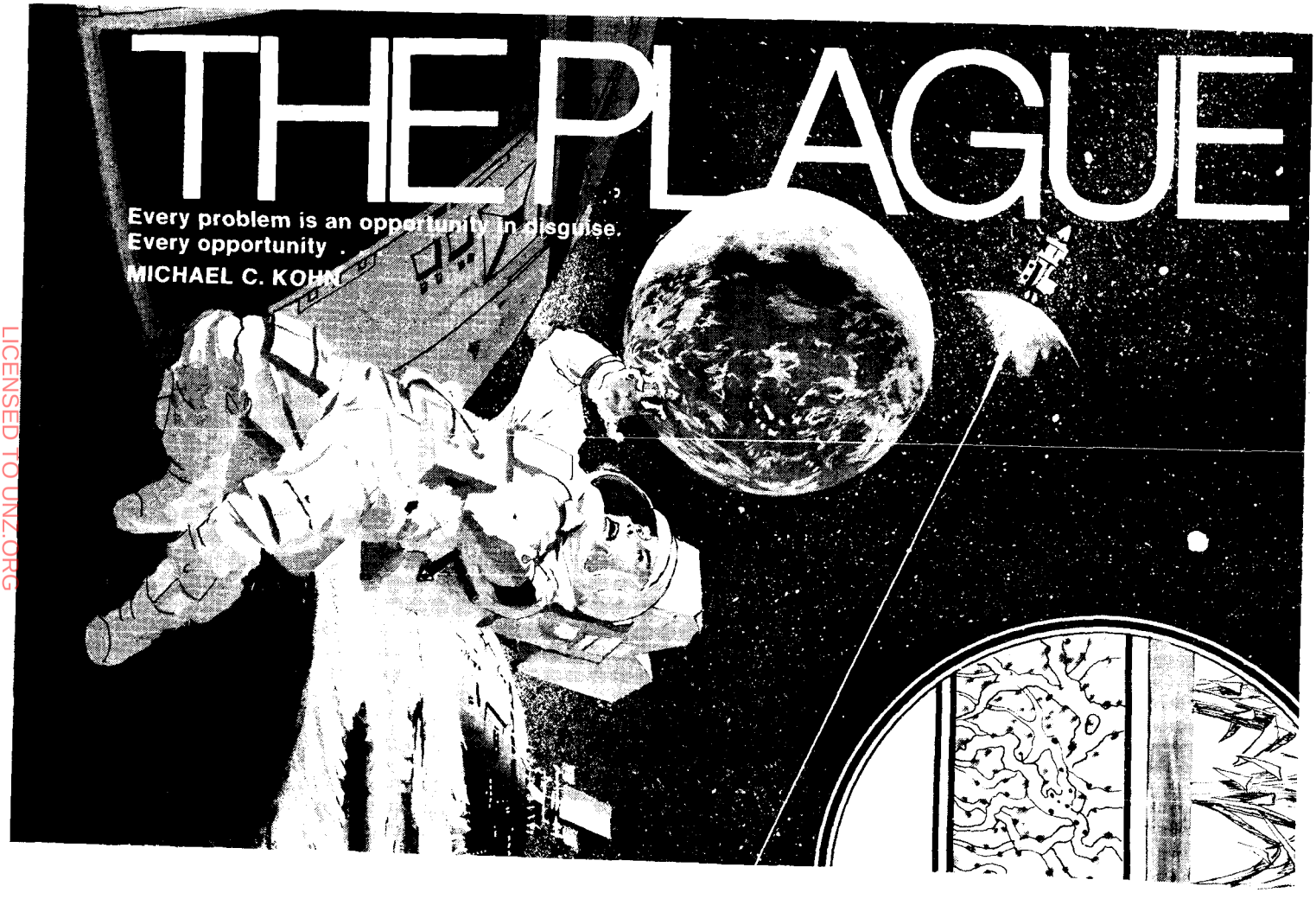
THE PLAGUE

Every problem is an opportunity in disguise.
Every opportunity .

MICHAEL C. KOHN



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Rudolf Kutznov gazed at the sunrise across the bleak moonscape. His relief was audible. Even after all these years in exile he had not grown accustomed to the long lunar night. The cylindrical shell of the fast breeder caught the dawn's light and cast a long shadow over the farm's canopy. Within the domes light was regulated according to Earth's twenty-four hour cycle, but Rudolf found it less distressing to measure time by the slow pendulum swing of the reactor's shadow across the barren rock outside the Soviet agricultural research station.

This was the first dawn since Marissa Kutznova died. Loyal and brave, she chose exile rather than separation from the man she loved. Now her homogenized remains were providing nutrients for the fields of wheat beneath the huge geodesic domes. Rudolf choked on the thought. He felt no consolation that Marissa was not alone in her fate. Scores of millions perished every day on the Earth. Huge tanks of homogenized corpses were innoculated with putrefying bacteria, and the grisly broth was incubated to produce the fertilizer desperately needed by the fields of pitifully stunted grain. Fortunately, the conversion to fast breeder reactors two years earlier made electric power plentiful, and there never was a shortage of bodies.

Kutznov didn't remember when the synthetic BK-25 virus was accidentally released. More than a year had passed before the magnitude of the disaster was fully understood and public hysteria forced political suppression of recombinant DNA research. The memory of the Soviet government's response still rankled. Scientists were prominent among the "refuseniks," those who could not accept the edicts of the party, from whose tyranny there was no redress. The government seized the opportunity to condemn scientists for what it termed "reckless and dangerous experiments." Soviet science would have to conform to the dictates of the state. Even Dr. Kutznov, the Soviet Union's preeminent biochemist, could never be forgiven for continuing the forbidden research. He was dismissed from his position at Moscow University, and only his "previous services to the republic" averted a harsher sentence than that which he now suffered.

Rudolf peered out the tinted window of his little laboratory at the sapphire disk of the Earth, the only jewel in the blackness of space. He longed for the sight of her forested hills and mighty oceans, the scents of her spring flowers, and the sting of wind-driven rain upon his face. He remembered the rich feel and smell of her fertile loam, so unlike the sandy soil formed from the pulverized basalts of the lunar maria. He had hoped that the Vozhd would recognize the value of his work and that he'd be allowed to come home, but now he doubted that he'd ever again see the golden fields of his beloved steppes.

Fifty kilometers across the Sea of Tranquility was the sprawling American installation. It was more than a research station; it was a working

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farm, shipping its produce to Earth's starving billions. Rudolf often thought of escape. He could reach the American farm in a few hours with a servo-walker, and even on foot the trip would not be too long for his old frame. But escape was impossible; all the airsuits were under guard in the station's single airlock. *Damned Soviet centralization! At least I still have my work.*

Rudolf returned to the bacterial cultures on his lab bench. Each petri dish had been innoculated with plague virus once the *Rhizobium* colonies had become established. Rudolf examined each petri dish. The colonies were still thriving; his new mutant strain was immune to the virus.

"At last," he sighed. "Now to see if you can still fix nitrogen."

Kutznov switched on the power for the incubator. He opened a bottle of sterile glucose solution and began to prepare a nutrient medium for a second-generation culture.

"May I enter?" came a voice from the doorway to Rudolf's laboratory. Formalities were strictly observed on the Moon. Crowded living intensified the need for psychological space.

"Viktor, my friend!" exclaimed Rudolf. "Come in; I want to show you something." He placed a slide on the stage of his microscope.

Dr. Malik entered the little laboratory and was led to the bench upon which the cultures were placed.

"You see, Viktor," said Rudolf, "these cultures are a new strain of *Rhizobium japonicum* that I developed. They can live and reproduce outside of soybean root nodules."

"That's quite an achievement," said the agrobiologist, peering through the microscope. "But will these new bugs fix nitrogen?"

"I'm just about to test the culture," replied Rudolf. "Stay a while. This will only take a few minutes."

Dr. Kutznov transferred some colonies to each of several ampules of nutrient broth with a sterilized wire loop. He placed the wire cage containing the ampules in the incubator.

"We'll know soon, Viktor," he said. "The broth contains only carbohydrate. If the colonies are to survive and multiply, they'll have to fix nitrogen to make protein."

"Think of what it will mean if you're successful," said Malik. "The station could become much more productive."

"The station!" Kutznov exclaimed. "No—the Earth!"

"But the plague, Rudolf! The virus may wipe out your bacteria, too."

The biochemist smiled. He made no reply. It was the first time Rudolf smiled since Marissa died. Viktor would not press his friend. He loved Rudolf in a quiet, undemonstrative way. He was warmed by the old man's open heart and stimulated by his inexhaustible enthusiasm and limitless curiosity. Let him savor his secret a while longer. Eventually the dam would fail, and Viktor would be inundated by the loosed torrent.

"The shuttle from Earth should have arrived by now," Viktor said.

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"I'm going to the spaceport to get the news."

"Wait, I'll go with you," said Rudolf.

Viktor knew that Rudolf never received any mail from Earth. Even his appeals to the Presidium for repatriation were ignored. Still, Rudolf hungered for news of home, and some of the other scientists at the station were willing to share their news with him.

The two men descended to the tube station. Rudolf disliked that place more than any other area on the Moon. When he was a boy, his grandmother frightened him with stories of sinners being eternally tormented in the fires of Hell. Sparks from the acceleration rings flickering along the walls of the tubes were the hellfires of his youthful memory, and the whine of the charge generators was the cry of tortured souls. In the loneliness of his desolate life Rudolf cried with them. Abandon all hope, ye who enter here.

Viktor pressed the call button. A car soon slid down the crackling tube and stopped at the platform. Once they were inside, Viktor punched out the code for the spaceport on the control console, and the car hurtled through the acceleration tubes surrounded by a cascade of blue hellfire. They passed the trip in silence.

The biweekly supply shuttle had already docked when they reached the spaceport, and the mail was being distributed. A small group of scientists was engaged in debate. Rudolf and Viktor joined them.

"They shouldn't have deactivated all those reactors, Natalie," said Dr. Kaganev. "Another accident is improbable."

"What's this about an accident, Andrei?" asked Viktor.

"A liquid sodium pump at the Prague breeder failed," replied the biophysicist. "They were able to prevent the reactor from going critical, but the sodium leaked out and ignited."

"There was a terrible explosion," said Nikolai. The biologist handed Viktor a week-old newspaper. "Enough plutonium was scattered to cause half a million casualties due to burns and radiation sickness."

"Not to mention the injuries from the caustic rain," interjected Andrei.

"They had to deactivate all the reactors near the major cities," said Natalie. "There were riots all over Europe and North America!"

News of the disaster spread among the farm laborers. They cast wary glances at the scientists. Their faces were dark with suspicion and smoldering resentment. The reactor's shadow was a pall draped over their potential tomb. Viktor felt the frost of their hostility, the bitter reproach of innocents deceived. He wondered if the others sensed it too.

Viktor passed the newspaper to Rudolf. The biochemist scanned it avidly. Shortly, he raised his head; his old face was ashen.

"There will be global famine," he said sadly. "The fermentation tanks alone cannot produce enough urea, and it takes a lot of energy to produce

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ammonia from atmospheric nitrogen. We needed those reactors!"

Dr Kutznov's comment rekindled the debate over the wisdom of deactivating the reactors, but he did not participate. He knew that synthetics could never meet the demand for fertilizer. The ultimate solution must be biological.

Azobacter vinelandii floated through the film of water surrounding the particle of Pennsylvanian soil. A BK-25 recognized a glycoprotein on *Azobacter's* cell wall and grasped its prey in an unshakeable death grip. In a moment the phage DNA was inside the host bacillus, subverting the bacterium's enzymic machinery to the production of more of its own kind. The episode of parasitism was an echo from the uncounted thousands of viral generations which spanned the years of Rudolf's exile.

Darwinian selection would decide the outcome. BK-25 also was doomed; a parasite which kills its defenseless host will eventally die in turn. But the Earth will be left barren, devoid of life. For all protein synthesis depends on bacterial nitrogen fixation.

On the surface above a shriveled leaf fell from a skeletal beech to land on the sere and brittle remains of its brothers. It was August.

Rudolf returned to his laboratory. The glittering racks of test tubes and pipettes relieved the drabness of the gray green walls, the oppressive uniforms of the workers' modules. He passed through the lab and entered his living quarters. The windowless cubicle was half the size of his laboratory. He always felt his confinement more acutely here. At least it was tolerable while Marissa was alive. Now his only comfort was the gaily colored patchwork quilt she had made. He pulled the quilt over his body and escaped into oblivion.

The gaunt bodies of the two little girls were heaved effortlessly into the fermentation tanks. They were not yet dead but were too weak from malnutrition to struggle for a few more minutes of futile living. There was no expression in their sunken eyes as the vortex sucked them below the surface of the thick suspension. The laborer on the scaffold above the vats reached emotionlessly for the next body.

Rudolf struggled out of his tortured sleep. He rubbed the fog from his eyes and forcefully exhaled. He needed work, and the incubated cultures were ready to be examined.

Rudolf drank his instant breakfast, dressed rapidly, and walked to the laboratory adjacent to his bedroom cubicle. He opened the door to the incubator and with long metal tongs withdrew the warm trays of ampules. The clear broth had turned amber. Rudolf swirled one of the ampules. The fluid inside was viscous, a good sign. Taut with anticipation, he smeared some of the liquid on a slide, stained it, and examined it with the microscope.

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The culture was teeming with bacteria. The mucopolysaccharides of the cell walls extended in long filaments. The fibers formed a protective matrix, Rudolf surmised, so the deadly plague virus could not reach the cell wall. Within this protective environment *Rhizobium* fixed nitrogen, grew, and reproduced.

Rudolf trembled with increasing excitement. Now he had to test the culture in the field. Would the bacteria still associate in colonies when they had more room to expand? Would they still thrive at the lower ambient temperatures? His scientific intuition answered yes. Dr. Kutznov could taste imminent success.

He put a syringe and several ampules of his precious broth in the pocket of his lab coat. Leaving his quarters, he strode down the path toward the experimental plots. Farm hands were unloading large bags of urea from a lorry. Even the women heaved the massive load easily in the light gravity. The fertilizer was produced in the chemical factory dome and was trucked to the several farms on the station on a regular cycle of deliveries. Weeds did not grow on the Moon, so there was only the monotony of fertilizing and watering between the planting and the harvest. Three crops a year were produced, and the station was able to provide all its own food.

Rudolf injected five cc's of the *Rhizobium* culture into the soil near the base of each stalk of wheat.

"Now do your work," he whispered.

He stood up and scanned the experimental farm. Clouds of urea dust hung low over the dwarf wheat and slowly settled in the still air. A young blond man drove into the nearby barn towing an array of fertilizer hoppers behind his tractor. His high muscle tone marked him as a recent arrival to the Moon. He leapt from his perch and floated down to the ground.

"You'd better take shelter, Comrade," called the young man while brushing urea dust from his coveralls. "I'm going to turn on the rain."

Rudolf entered the barn. The farm hand unlocked a control box and threw a switch. The water pumps chugged. A gentle spray fell from nozzles suspended from the dome. After a few minutes the drizzle became a steady downpour.

"How long will you be watering?" asked Rudolf.

"At least half an hour," came the reply. "We need a good soak to drive the fertilizer down to the roots. You don't seem to know too much about farming," he added suspiciously.

"No, I'm a biochemist. Rudolf's the name. I'm supposed to be trying to find a new way of making fertilizer that will not require lots of energy."

"I'm Ivan," the young man responded. "I didn't know we had scientists up here. I thought this station was supposed to develop new farming methods." There was a hint of resentment in his voice.

"Many roads lead to Moscow, Comrade," Kutznov recited the familiar motto. "What brings you here?"

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"I was caught hoarding food," Ivan replied glumly. "I admitted my guilt, so I didn't get the maximum sentence. I was sent here instead."

Rudolf did not ask what the maximum penalty was; he knew.

So the inevitable panic had already begun on Earth. Food reserves must have been very low when the Prague breeder exploded. This season's harvest on the Earth would surely be inadequate. Food riots would not be long in coming. Rudolf felt very small and powerless, an old man in disgraced exile. Who would listen to him?

The young laborer was gazing thoughtfully at the rain. "What surprised me most about the Moon was the water," he said, interrupting Rudolf's reverie. "I always thought that there wasn't any water on the Moon at all."

"Oh, there's plenty of water here," Rudolf said, "but it's all bound up chemically in the rocks. The engineers found a way to sort of boil the water out."

"How come the water doesn't just drain away?" asked Ivan.

"When the surface was blasted to make soil, a shell of bedrock remained," answered Rudolf. "The result was an artificial aquafier. Something like the water traps under the deserts on Earth," he added wistfully.

"You miss the Earth, don't you, Comrade?" asked Ivan. "How long have you been here?"

Rudolf was startled by the young man's perceptiveness. "Too long," he murmured.

"It's not the way you remember it, Comrade scientist," sneered Ivan. "Hardly a weed grows now. The plague left the ground sterile, and the wind blows the dry dirt away."

The wind! Its winter voice whistling through the forest had promised spring's resurrection, and its breath over the meadow had been a contented sigh. Now it was a dirge for a dying planet.

The soothing patter of rain began to abate as the end of the shower cycle approached. Rudolf made his farewell and left the barn. Farm laborers were beginning to return to the fields. In the distance a tractor coughed to life.

Rudolf did not return to the test plot for more than a week. He reviewed his laboratory notes and began to write a detailed report about his research. If the field test was satisfactory, he planned to send his report to the Presidium. Surely that would convince the leaders to allow his return.

"Rudolf!" Viktor Malik burst into the biochemist's laboratory. The normally reserved man was quivering with excitement. "Your test plot! Come look!"

They left the laboratory and hurried down the path to the experimental plots. Rudolf's wheat was taller and greener than the wheat in the untreated control plot. The spikes of grain were heavier, with bigger kernels even than the heavily fertilized crops.

"Everyone's been noticing!" exclaimed Viktor. "I just heard about it this morning and went to see for

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myself. How did you do it, Rudolf?"

"My new bacterial strain did fix nitrogen in the lab, Viktor," answered Rudolf. "So I had to test it in the field. I innoculated one of the test plots with my cultures."

Viktor dashed into the barn and returned with a spade and a discarded fertilizer bag.

"Let's get a soil sample," he suggested. "We'll see if the *Rhizobium* is still living in the ground."

He turned over some soil and shoveled a sample into the bag. Dr. Malik was right, of course. It was important to know how long the bacteria could survive in the ground. But Rudolf saw something much more significant.

"Look!" he indicated to Viktor. "Nodules on the roots."

The two scientists stared in wonder. Kutznov gently tore some of the nodules from the roots. They examined several other plants. All had developed root nodules.

"Rudolf, only legumes and clover can be infected by *Rhizobium*," declared Malik. "Wheat has never been observed to form root nodules—not that we haven't tried to induce it. How were you able to succeed?"

"Actually, I was only trying to get the bacteria to live freely in the soil," replied Kutznov. "The nodules are an unexpected bonus."

"But how is your strain different from all the others we tested?" asked Viktor.

Rudolf tried to evade the question, but his friend persisted. "Well, I suppose I can tell you now. I've already started writing a paper about my research."

They walked to the shade of the barn and sat on a pile of sacks of fertilizer.

"You know why they sent me here, Viktor," said Kutznov. It was a statement of fact rather than a question.

Malik nodded.

"I've been continuing that same research here on the Moon," Rudolf confessed. "The BK-25 virus recognizes a specific glycoprotein on the bacterial cell wall. I've isolated the gene that codes for that protein and replaced it with a similar gene from another bacterium. I thought that would make the *Rhizobium* immune to the virus. And, Viktor, I was right!"

Malik stared in stunned silence. Rudolf must have smuggled the necessary restriction enzymes up to the Moon when he first arrived. *The naive old man probably thinks he'll be rewarded. How can someone so brilliant be so foolish?*

"You musn't mail your paper, Rudolf," he whispered, his voice quivering with anxiety.

"But it's the answer to the plague," Kutznov protested. "It will save mankind from starvation."

"Don't expect the government to be grateful. Or the people either. When they hear about your gene transplants, they'll panic and . . ."

"Murderers," screamed Ivan from the barn doorway. "You brought us the plague! You made the reactors!"

He seized a pitchfork which was

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leaning against the wall of the barn. His eyes flashed with unthinking hatred as he bounded toward Rudolf. Viktor pushed his friend aside, and the tines of the pitchfork sank into the bags of urea.

The young farm hand retrieved the pitchfork and once again charged at the scientists. But his fury clouded his judgment, and they were able to avoid Ivan's vicious lunge. Ivan spun toward them. He stabbed repeatedly at the retreating scientists. Though his face was beaded with perspiration, he was unstoppable, a juggernaut powered by visceral rage.

Several laborers had congregated at the barn door. The sullen crowd stood transfixed, glaring stonily. The only exit was blocked.

Ivan continued his relentless pursuit. Rudolf and Viktor were pressed into the corner of the barn, where they cowered, aware of their complete vulnerability. Ivan leveled the pitchfork.

"Planet killers," he snarled.

The cold steel talons lashed out toward the cringing scientists. The pocket of Viktor's lab coat was torn.

"Help us! Stop him!" Viktor cried desperately.

The ranks of the mob wavered and broke. Finally, two men approached and gently led Ivan away. The others scattered.

Rudolf crouched in the corner of the barn frozen with terror. Viktor too was shaken by the violence and the hostility of the crowd. He helped Rudolf to his feet and led him back to his quarters.

"What will happen to Ivan?" asked Rudolf when he had regained his composure.

"He'll probably be disciplined," replied Viktor. "The authorities can't tolerate disorder. But I'm afraid they'll put a stop to your research as well."

"The stupid fools," groaned Rudolf. "Can't they see that this is the answer?" On his outstretched palm lay several wheat root nodules. Tears of frustration glistened on his cheeks.

"It's you I'm concerned about," said Viktor. "The government is trapped by its own rhetoric. I don't want you to become their scapegoat again."

"Isn't there anything we can do?" Rudolf asked.

"I don't know," responded Viktor helplessly. "Maybe when the situation becomes desperate enough they'll turn to science again."

Kutznov nodded. "Yes, now I understand. Now I know what I must do." He embraced his only friend. "Thank you, Viktor, for everything."

As soon as Viktor left, Rudolf bolted the door and began measures to safeguard his discovery. He knew that a description of his work and of Ivan's attack had been sent to Earth in a coded radio message. He did not have much time. Soon the security force would place him under house arrest, and he'd be watched closely. In a few days the secret police would come from Earth to arrest him and destroy his laboratory.

Rudolf injected a local anesthetic

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from his first aid kit into the skin under his left arm. He made three cuts in the insensate skin with his scalpel and peeled back the flap. Blood welled up in the wound. Rudolf sponged it away. He inserted one of the wheat root nodules that he harvested from the experimental plot. Then he sewed up the flap of skin and covered his work with a surgical dressing. He could always claim to have been injured while dodging Ivan's attack. The *Rhizobium* culture could be regenerated from the cells of the root nodule. His discovery was safe for a while.

Kutznov selected a large root nodule from his harvest and split it with his scalpel. His hands trembled as he attempted to slice off a thin wafer from the center of the nodule. If he only had a microtome! The resulting slab was not too even, but it would have to do. He stained it with crystal violet and placed the tissue sample on a slide. The microscope revealed the bacteria living within the cells of the root nodule. Kutznov chose a group of cells which were in good focus. He soon had a photomicrograph of the specimen taken with self-developing film.

His left shoulder ached when the anesthetic wore off, but Rudolf gave it only passing notice. He wouldn't take a painkiller. He still had much work left to do, and the drug would make him too sleepy.

Rudolf appended to his report a few sentences about the formation of nodules on wheat roots. There was time for no more detail. He hastily spread all his photomicrographs and his handwritten notes on his lab bench. When his camera was loaded with self-developing ultramicrofilm, he made a copy of his report. He rolled the developed film into a tight coil and placed it in a small polypropylene capsule. No sooner had he sealed the capsule with epoxy cement than there was a sharp knock on the door.

"Security! Open up!"

Frantically, Rudolf swallowed the capsule.

Kutznov slept under guard that night and for two further nights. His restless sleep was tormented by visions of wilted fields. He heard the wind howling across the barren steppes, and he saw the clouds of dusty soil billowing before the advancing front. Caught in a sudden updraft, the dust soared in a broad black sheet. A cumulus cloud became Death's skull, and his black robe swirled as his scythe leveled the withered grain. The fallen stalks were human corpses.

Rudolf dreamed of the fermentation vats and the cadaverous laborers hurling bodies into the putrefying sludge. A worker extended his emaciated arms to grasp the wasted body of a woman. Even in death her slight frame hinted at the delicate frailty of her life. But her countenance was serene. It was Marissa.

Kutznov awoke in a hot sweat. He felt the bed sinking beneath him, and the little room seemed to sway in time to his exaggerated pulse. Viktor was standing near the bed. Rudolf grabbed his arm.

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"Don't try to get up," Viktor advised him. "You're in the infirmary. You've contracted some kind of fever. It has the doctors mystified."

Rudolf turned his head. He saw two husky men wearing surgical gloves and masks. Rudolf concluded that they were KGB agents. He knew there would be more agents outside the room. *The authorities always overdo things.* He turned back to Viktor questioningly.

"Yes, Rudolf," his friend said grimly. "Everything has been destroyed, even your smallest note."

Rudolf's head sank into the pillow. He sighed resignedly.

Viktor turned to the police agents. "There aren't supposed to be any disease germs on the Moon. No one ever got sick here before. We're not equipped to help him. You must take him back to Earth with you!"

"We cannot do that, Comrade scientist," replied one of the agents. "Who knows what new plague germ the old fool has created! He must stay here."

"If it is a new disease germ, you're condemning the entire station," retorted Viktor.

"It can't be helped," the agent said coldly. "There are more people on Earth than there are here."

"If you're frightened," sneered the second agent, "you can always throw the old man outside the dome."

Viktor was horrified by the suggestion. The agents merely smirked. They were adamant.

Rudolf tugged at Viktor's arm. "Give me an airsuit," he rasped. "I'll go. I don't want to expose you to the fever any longer."

Viktor tried to dissuade him. "You're too ill. You wouldn't survive out there even with an airsuit."

"An airsuit, Viktor," Kutznov repeated earnestly, desperately. He tightened his grip on Viktor's arm.

Viktor was distraught. He knew that Rudolf wanted to escape, but the situation seemed hopeless. Dr. Malik looked at the police agents. Impassively they nodded in assent. He couldn't survive longer than the limited air supply anyway.

"All right, Rudolf," Viktor sighed. "If that's what you want."

The three of them helped Rudolf to the airlock, and Viktor left for his laboratory. Rudolf was in his suit when Viktor returned, carrying a flask of water. Malik poured about a liter of the water into the waste treatment compartment at Rudolf's hip and taped the drinking straw to his friend's mouth.

"The moisture will activate the waste recycling module," Viktor said softly. "At least you'll have enough water."

Rudolf lay a gloved hand on Viktor's shoulder. Good-bye. He formed the unspoken word with his lips. Then he lowered his faceplate and signaled to the security guards to close the pressure seal.

"Good-bye, Rudolf," Viktor choked on the words.

Malik stepped outside the airlock. The door was sealed. He heard the

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sharp puff of escaping air. It was over. Viktor returned to his cubicle; he'd do no more work that day.

Rudolf took a swallow of water. It tasted sweet. *Viktor must have added glucose to keep up my energy. Good boy!* Kutznov started out on his trek across the Sea of Tranquility. He fought back the narcotic effects of the fever as he picked his way along the pock-marked, boulder-strewn plain. At intervals he'd stop to rest and swallow more of Viktor's parting gift.

How far had he walked? Ten kilometers? Fifteen? Rudolf did not know, but it seemed that he'd been stopping more frequently to catch his breath. His breathing had become more labored, but he thought it was mostly the effect of the fever. Now he gasped even during his periods of rest. He reached over his shoulder and pulled the air gauges forward until the extension tubes were taut. He squinted so he could read the dials in the harsh glare of the sunlight. Empty! The life support system was in the rebreather mode. The secret police agents had given him just enough air so that he couldn't make it back to the station once he had to rebreathe his own exhaled air. Despair hung its black shroud on Rudolf's heart, but he drove onward, spurred by the perseverance born of desperation.

The sunlight glinted from a shape in the distance. A large boulder? No, its form was too regular; it must be a small dome! The black gloom of despair dissolved with his rekindled hope. Rudolf struggled onward, gasping for air. He stumbled over loose rocks, occasionally causing his body to float helplessly over the surface in the light gravity. He scrabbled across the rim of an ancient crater filled eons before by upwelling lava. His brain reeled from the fever. His chest screamed for oxygen. His muscles ached from fatigue. Rudolf pressed on.

Finally he reached the dome. Its surface was unbroken by any obvious door or window. It was just an instrument dome. He was defeated. He slumped against the steel wall and surrendered to exhaustion. His helmet struck the side of the dome. A crack appeared and grew wider as a panel retracted below the lunar surface much like it does on the dome of an astronomical telescope.

Rudolf staggered toward the opening. He entered the dome, but he didn't see the step. He toppled down the steel staircase, and his body came to rest with his feet elevated on the bottom steps. Rudolf hadn't heard the whirr of the motor that restored the dome's panel to its original position. Though his faceplate had broken away, the hiss of air filling the room seemed to come from a long distance. He could hardly feel the warm liquid from the water recycling plant trickling down his throat.

Rudolf felt a cool breeze playing gently on his brow. He forced his eyes open. He was lying in bed in a large bright room. Diffuse sunlight streamed in through a window. The delicate scents of spring flowers were

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racket, *n.* (Slang), a branch of crime that involves or may ...rsonal violence.

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in the air. The merry chirping of songbirds lifted his spirits. A dark form in a white coat loomed above him.

"I see that our distinguished guest has rejoined the living," the stranger said. "I'm Dr. Karen Washington, but my friends call me Fatima Jamal."

Rudolf could focus his eyes now. He saw Dr. Washington's tight black curls bobbing about her head as she listened to his chest through a stethoscope.

"You're a remarkable man, Professor Kutznov," continued Karen/Fatima. "Congratulations on your escape. There are a lot of people who want to talk with you. Let me know when you feel up to it."

"Where am I?" asked Rudolf. His mind was still back in the little dome.

"You're in the hospital at Tranquility Farms," replied Karen. "Isn't that where you wanted to be?"

Rudolf still looked confused.

"I think you'd better speak to Mr. Packard," Karen said. "He flew up from Earth today and has been waiting for you to wake up. You rest. I won't be long."

She left the room but returned in a few minutes with a distinguished-looking man. William Packard represented the American State Department. He was here to determine if Dr. Kutznov requested political asylum, and he was empowered to grant it.

"It never occurred to us that you weren't trying to get here," apologized Packard.

"I was," said Rudolf, "but I ran out of air. I must have walked ten or fifteen kilometers when I found the dome. I fell down the stairs, and the next thing I knew, I was here."

"Five kilometers," Packard corrected. "That was one of our advance line robot surveillance stations. Oh, don't be shocked, Dr. Kutznov. Your people have them too. The only difference is that ours are designed to facilitate escape from the Soviet installation. But you caught us in between inspection cycles, and it was nearly a week before you were discovered by a routine patrol."

"It was amazing!" exclaimed Karen. "Nearly a week with no sign of protein deprivation. That was our first clue."

Dr. Washington produced a large test tube from her coat pocket. Inside was a large nodule. Its surface was a tangle of matted fibers. Rudolf's hand flew to his underarm.

"That nodule was largely destroyed by your immune system, Professor Kutznov," Karen said. "This one came from your lymph node. It was fixing the nitrogen dissolved in the lymph and making amino acids. That's why you're so healthy after a week with only water dripping down your throat."

"We—uh—recovered the microfilm also," added Packard delicately. "Our biologists are already growing *Rhizobium* cultures. We plan to market powdered root nodules as a new fertilizer."

Rudolf smiled. It would take a capitalist to think of that. ■

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the reference library

LESTER DEL REY

EXPECTATIONS:

I wonder how many readers today open an issue of a science fiction magazine—particularly a new magazine—with a thrill of expectancy? How many rush home from the magazine rack, forgetting everything else? How many actually glue themselves to the pages and read from cover to cover, including the advertisements?

Well, believe it or not, once upon a time that was a fairly familiar reaction to many of us. Long before it became Analog, there was a Clayton magazine called *Astounding Stories*. And it died, just after announcing that it was about to publish the first installment of a new serial by E. E. Smith. In those days, that was a tragedy. Then one day, scanning the stands for something to read, I beheld a new issue! Another publisher had brought the magazine back to life.

I had gone out to get breakfast, with a quarter in my pocket. The magazine cost 20¢. (Yes it did; and breakfast could be had for 15¢, with refills on the coffee!) But there was no question of choosing. Who wanted breakfast when there was *Astounding* to read?

Conditions, as well as the price of everything, have changed. Back in the old days, we were lucky if a quarter million words of science fiction got printed in a month, and each appearance of more was an event. For every three days of reading there were twenty-seven lean days. Now any one of several publishers—DAW, Berkley, Ace, Del Rey—puts out far more than that, and the total is far greater than the most avid reader could hope to cover. Even the keenest appetite must become somewhat jaded with such surfeit.

Yet expectations still persist. When another *Darkover* novel, a book by C. J. Cherryh, or a new Arthur C. Clarke book comes along, I still drop everything I can to read it. And I still feel the tingling eagerness. Sometimes I can experience that when a blurb suggests something really new.

I suspect that a lot of younger readers still feel much as all of us did so long ago. Throughout large areas of this country, the teenage readers (and indeed, many far older) don't have unlimited resources with which to buy books; and in many areas, the stands are still carrying only a small part of the flood pouring from the publishers. To many, a new book of science fiction must still be something to be scanned eagerly, to be weighed against other purchases—and sometimes to be put above what seems more pressing.

The difference may be that where we then had to take whatever was laid before us, there is now a much wider choice; the books must be scanned for clues as to their offerings. But once chosen, the expectation of pleasure may be just as great.

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How often, I wonder, is the expectation fulfilled?

Certainly the reader is entitled to an honest guide to making his choice. Otherwise, the repeated thwarting of such expectancy must eventually deter even the most optimistic.

A case in point: **Journey**, by Marta Randall (Pocket Books, 324 pp., $1.95). According to the back cover blurb, "Somewhere in the cosmic darkness lies the unsettled Aerie. It is nothing now. Only a vast muddy rock. But it brings to Jason and Mish Kennerin the hope of a new beginning as their own planet crashes down around them." Never mind that cosmic darkness hardly applies to a planet with a perfectly good sun. Look at the promise of stirring action in escaping a crashing planet, the hardship and toil in turning a nothing, a muddy rock, into a habitable place.

Well, at the beginning of the novel, Jason and Mish haven't left any crashing planet. They've chosen to leave Earth, which is hardly crashing. They've settled, not on a muddy rock, but on a perfectly good and fertile planet. They've been there long enough to have a couple of kids (plus one brought with them), and establish their big house and barn, find docile, friendly natives to do most of their work, as well as bringing servants with them.

"They forge a mighty empire—a family dynasty whose name will thunder across the generations to the farthest reaches of time and space," the blurb continues. Again, forget that a dynasty is not an empire, but only a line presiding over the empire. Without giving away anything important, I can report that there is no real empire at the end of the book, and damned little evidence that the family has any desire to have its name thunder.

The blurb writer may have read the book—but there's not much evidence of it, nor any real evidence to give an honest impression. True, blurbs are meant to sell, and are going to be highly favorable; readers know that and can make allowances. But this blurb distorts the nature of the book, making it seem a wild adventure, when it was never intended by Randall to be such, I'm reasonably sure.

Now Marta Randall can't be blamed for the blurb, and it would be unfair for any disappointed reader to blame her for not living up to the expectations aroused. Nevertheless, since the blurb writer wisely didn't sign the piece, Randall is going to be blamed. That's the nature of human disappointment.

In the slightly milder note that came with my review copy, the novel is described as "an entirely new genre in science fiction: the family saga set in the distant future." There is at least a measure of truth in that. The book does deal with the family Kennerin in their efforts to make something of life and the world of Aerie. They find their fairly isolated planet suddenly swamped by refugees from another world about to have its sun go nova, and they have to help those people survive and settle in. One of the sons bitterly resents the intrusion of these new settlers, and much of the book deals with Hart and his problems of adjustment.

Unfortunately, some of the real difficulties and developments, so necessary to show for the feeling of a family

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saga, are jumped over. The book comes in sections, with intervals of up to seven years between sections. And much of the settling in of the new people, the development of their market, and the growth of the children, gets lost between sections. This is particularly bad in the case of Hart. We see him begin to be dominated by an old man and then jump to a time when he clearly dominates the other. We see him throughout growing into something of a monster, filled with total hostility to his family, contemptuous of human consideration for life. Then he's sent off to a university on another planet, to return years later concerned about his father, desiring acceptance by the family, and generally full of all he lacked before.

As it stands, this switch is totally unbelievable. True, events might have justified this difficult change of character—but we don't see those events. (And the final section, which is the best conceived and written in the book, takes place away from the family and the planet. It somewhat rounds out the character of Hart, but it doesn't add much to the family saga but it.)

Also the whole background here strikes me as an unfortunate choice. The Kennerin family makes its living from farming, as most of the refugees must do. This is essentially a farming planet, with their one valuable export also produced by farming. Once in a while there is some touch to suggest a farm, but mostly the business of farming is somewhere in the remote background. (Maybe this is worse for me than for many others, since I grew up on a farm. I know what life can be like there. It doesn't read as if Randall has any clear conception.) There seems little evidence of the preoccupation of farmers—certainly not the problems that beset pioneer farmers on a new planet. Weeds and pests, weather perils and emergencies, sick animals, and the daily grind of tending animals and crops simply aren't in any real evidence. Only token gestures now and then.

The book seems to take place against a painted background—and not very well painted, at that. And a family saga of a pioneer family simply won't work against such props.

Go back and read about the Whiteoaks of Jalna or dig out some of the works of Edna Ferber!

The family saga is a somewhat artificial type of novel with its own conventions, and maybe they don't fit science fiction. Or maybe they require a much longer book than even this one. But certainly they should never be tried without a full realization that they don't work unless the family and its total background must be completely and inextricably bound together, each influencing the other in all possible ways. You can't have a world with natives willing to do what the Indians did for the Spanish in California during early days without radical changes in the attitudes of the "masters," as an example.

It's been quite a while since I read one of A. Bertram Chandler's novels about Commodore Grimes, but I'd always found them to be at least reasonably interesting adventures, usually with a fine situation that dominated most of the story. So I picked up **To Keep the Ship** (DAW Books, 175 pp., $1.75), expecting fairly pleasant

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entertainment. The blurb and the cover both promised the expected ingenious fix for Grimes to stumble into.

Unfortunately, however, Grimes has changed. No longer the leader of men, he is now presented as a captain of a single ship—apparently long before he became Commodore Grimes. He's something of a helpless stooge, barely making out by acting as sort of watchman for a ship parked around some world or other. Gone is the crusty, trusty master of men and situations. This Grimes is just another spaceman with a run of bad luck. He isn't even operating in the Rim, so far as I can see.

"Commodore Grimes: SF's answer to Horatio Hornblower," goes the quote from *Publisher's Weekly*. And that's what he used to be. But I can't quite see Hornblower, even when he was just starting out, being quite so feckless as Grimes now seems to be.

Most of the story is routine. A bunch of rather inept exiled royalty seize his ship to get back and take over their planet, lost in a revolution. They use him as navigator and lock him up in his cabin, where he does just about nothing. Does he get himself out of this picklement? Nope, instead he has to be helped out of it by Susie, a fairly nice gal mixed up with the wrong crowd. She and her brother, the engineer, fix it so he can get away with the ship.

In helping her to what she wants, he precipitates the trouble shown on the cover and mentioned in the blurb. His ship is infested with mannikins—little models of Susie that multiply rapidly. But unlike the real Susie, there's nothing warm and friendly about them. They are interested in him only as food, when they're not eating each other.

And again, he can't do anything much to help himself, except lock himself in a lifeboat. His rescue has to come from the happy arrival of an old girlfriend.

In fact, throughout the book, Grimes is hardly the hero we know him to be. There's none of the canny trickery or the dominating personality we expect. He flunks every test until someone else saves his skin. Even the situation with the mini-Susies isn't up to what we'd expect; in the old days, much was made of whatever the situation might be. Here, it's only a small part of an otherwise routine book.

Come on, now Chandler! Let's get back where we belong, with *Commodore* Grimes and his mate and the worlds that could only exist out at the Rim, where grand mixups could exercise all of the many talents for leadership of your hero. Enough of this rest and rehab stuff. Bluff and counterbluff, that's the stuff!

My own expectations led me somewhat astray in the case of Stephen Robinett's **The Man Responsible** (Ace, 245 pp., $1.75). The blurbs were accurate enough, but I *knew* that Robinett is a science writer; and there was the tiny "SF" on the spine to encourage me.

Well, marginally, it is science fiction. But it's really a sort of detective-mystery story, with a bit of science fiction creating the mystery. It deals with the attempts of a lawyer (it says, though he spends more time detecting) who is trying to investigate one of the most elaborate business deals—or swindles—possible.

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The science fiction rests on the possibility of conveying memories from one person to another by feeding the right RNA. (The old *Wormrunner's Digest* bit, but greatly improved.) Also on some future developments of computers that pretty much control the world and obviously make any elaborate swindle impossible. Obviously.

Nicely written and well characterized for this type of story. In fact, once I got over the idea that this was real science fiction, I enjoyed the novel. (And I must admit I've read supposedly "pure" sf novels that had a lot less real science fiction than this one.)

I'd recommend it for anyone who likes at least an occasional mystery story as well as science fiction, or for a mystery reader who doesn't mind some science fiction in his story.

Three Hainish Novels by Ursula K. Le Guin (SF Book Club, 370 pp., $3.98) is a bargain, indeed. These novels are those that preceded Le Guin's *Left Hand of Darkness*. And while they can be found separately in paperback, they'll cost more than this edition.

Included are *Rocannon's World*, early Le Guin and lacking the deft hand with characters and developments she later showed; but the background of this novel makes much that happens in later stories easier to follow. *Planet of Exile*, the story of a lost colony of men on a planet of terrible winter, forced to accept the help of the natives—a very good adventure story with sharp, believable characters; and *City of Illusions*, strangest of all her books, picturing the aftermath of the conquest of Earth mentioned elsewhere in Le Guin's work.

Judging by the "Acknowledgement" at the beginning, this edition of the novels is corrected from the errors that crept in previously and can be considered definitive.

And finally, **The Hills of Faraway, A Guide to Fantasy** by Diana Waggoner (Atheneum, 302 pp. plus indices, $16.95) far exceeds my expectations.

There's a chapter on the "Theory of Fantasy" which really does cover the essentials of good fantasy, followed by a long chapter with the basic types of fantasy listed and discussed. Appendices deal with dates, awards, illustrations and subgenres. And there's one of the best bibliographic sections of fantasy I've yet seen, running to 177 pages. This covers just about every major writer of fantasy (and some by no means major). The books are listed. And for those who can't remember authors' names, the books are listed by title in an index which gives the page on which that work is mentioned.

There are a few areas where I have some slight disagreement on the theory of fantasy. There are several statements of opinion about the worth of certain books that I find surprising from one who obviously knows the field so well. (Such as listing Fletcher Pratt's *Well of the Unicorn* as an "unsuccessful" heroic fantasy.) But this is still the best coverage of fantasy fiction I've seen.

It's hardly for the general reader. But suggest it to your library. It's a valuable book of reference, and should be an excellent source book for fantasy fans.

What more could be expected of a guide? ■

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brass tacks

Dear Mr. Bova

It is an insufficiently advertised fact that two of the central figures in the birth of space travel, Tsiolkovsky and Goddard, both "invented" reactionless drives in their youth. In both cases the vision of a vehicle quietly rising into the heavens, driven by unbalanced centrifugal forces, spurred their subsequent lifelong researches into rocketry. Within a short while (a sleepless night for Tsiolkovsky and few months of experimenting for Goddard) both decided their original idea was wrong. Both learned more physics and proceeded to lay the foundations for present day space travel.

A working reactionless drive, as searched for by Russell Adams in the April issue, may seem an ideal space drive because the only energy that has to be supplied is the kinetic energy of the vehicle (and maybe this will be returned during deceleration?) As such it would be vastly more efficient than rockets, which put most of their energy into the exhaust. The fact that there don't seem to be any plausible physical theories which permit global violation of momentum conservation dampens at least my enthusiasm about this line of inquiry.

There *is* a plausible (but experimentally unconfirmed) extension of special relativity which permits a propulsion system even better than a reactionless drive, one that requires only a vanishingly small amount of energy. Tachyons are proposed particles that travel faster than the speed of light.

The energy and momentum of a tachyon moving at some velocity v greater than the speed of light c are:

$$\text{Energy} = \frac{Mc^2}{\sqrt{\frac{v^2}{c^2} - 1}}$$

$$\text{Momentum} = \frac{Mv}{\sqrt{\frac{v^2}{c^2} - 1}}$$

where M is the magnitude of the "rest" mass of the tachyon (which can never be at rest). Note that as v becomes large, the energy approaches Mc^3/v and the momentum Mc. For the extreme case of infinite velocity the momentum is large and finite, but the energy is zero.

Infinite velocity tachyons exhausted from a rocket engine would cause a momentum change which propels the rocket (by conservation of momemtum!). Unlike slower rocket exhausts they would not carry mass or energy away from the ship. Thus the fuel cost is zero (or near zero, if the tachyon velocity is not quite infinite).

Tachyons do not violate energy conservation. The kinetic energy the rocket builds up comes from the fact that effects which propagate faster than light are not uniquely ordered in time. The particles which observers on the rocket describe as leaving the ship seem to stationary viewers to be moving toward it, impacting it in the tail. Furthermore, in the stationary frame the velocity of the tachyons is not

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infinite, and their energy is nonzero, and this energy is totally converted to kinetic energy of the rocket during the impact. Somehow the rocket is coercing the universe to supply the energy to accelerate it.

Arranging several tachyon rockets of the kind described on a pinwheel produces a perpetual motion machine of the second kind, which gets its energy by cooling down its surroundings. Also tachyons could be used to send messages backwards in time. These consequences may make the existence of tachyons less plausible, but what a boon if they are ever discovered!

HANS MORAVEC
Artificial Intelligence Laboratory
Stanford University
Stanford, CA 94305

There's an old Hungarian recipe for an omelet which begins with, "First, steal some eggs . . ."

Dear Ben,

I bet you never thought the day would come when this Old Newtonian would write Brass Tacks for any reason except to gripe about a high-velocity article, or demand that some half-baked quark walk the planck.

Kidding aside, the only flaw in Analog's articles is that they require special equipment—*eyes*. Up-to-the-minute breakthroughs that come hot off the griddle to the *sighted* are not reaching a large, intelligent, desperately hopeful audience—the average, middle-aged *blind*.

Sure, there are programs for the blind. Student programs, for example. But how many middle-aged people—blind or otherwise—qualify for student programs? There are Talking Books—a great program in its general-culture area, especially if there's no need for *immediacy*. Charles Dickens is as valid now as a century ago. But a 1970 space textbook is already outdated.

On Florida's west coast, the blind and their friends are closing the information/time gap with friendly, do-it-yourself cassettes. The Pinellas Blind Library, partially funded by the Comprehensive Educational Training Act, has been organized to provide *immediate* data.

With these Instant Cassettes, a science article in Sunday's newspaper can be read into a cassette, sent to the Library, edited into attention-span segments on a master tape, replayed onto the distribution cassettes and mailed to the blind *free of charge* within the week. Updating can be continual, and Library users receive a monthly news-cassette listing current tapes.

I said the Library was CETA funded. I should have said, funded ha-ha. Even with donated equipment, volunteer readers, and private and civic contributions, the Library is hard put to acquire enough distribution cassettes to shorten the waiting lists. Therefore the emphasis is on material which can be contained on *one* 60-minute cassette—tough luck for the fans of the three-volume novel but ideally suited to science buffs who enjoy brief, lucid articles—and the brief articles usually are the lucid ones.

Now, many Analog readers teach and/or work in scientific fields, and they talk their preliminary notes onto cassettes. After the lecture is delivered or the report is transcribed, they erase

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A Calendar of Upcoming Events

log

27-29 October
UNREEL (SF, fantasy, and horror convention) at Winters College, York University, Toronto, Ontario, Canada. Guest of Honor—Rick Baker. Info: UNREEL, P.O. Box 6711, Station A, Toronto, Ontario, CANADA.

1-5 November
EUROCON 4 (European Science Fiction and Fantasy Convention) at the Free University of Brussels, Belgium. Guests of Honor—A.E. van Vogt and Frank Kelly Freas. Films, SF art exhibition, lectures and speeches with full simultaneous translation in 5 languages, SF-fancy dress party, etc. Info: Herman Ceulemans, Bredabaan 798 bus 2, B-2060 MERKSEM, BELGIUM.

3-5 November
LOSCON 5 (Los Angeles area SF conference) at the Huntington Sheridan, Pasadena, CA. GoH—Robert Bloch. Registration—$8 until 20 October, $10 thereafter. Info: Loscon, c/o Elayne Pelz, 15931 Kalisher St., Granada Hills CA 91344.

3-5 November
CONCLAVE III (Eastern Michigan area SF conference) at Metro Ramada Inn, Romulus, Mich. GoH—Theodore Sturgeon, Fan GoH—Elizabeth Pearse. Registration $5 until 1 October, $7 at the door. Banquet $10. Info: EMU SF Society, 117 Goodison, EMU, Ypsilanti MI 48197. Checks payable to: Waldo and Magic, Inc.

3-5 November
NOVACON 8 (Midlands area SF conference) at the Holiday Inn, Birmingham, England. GoH—Anne McCaffrey. Registration L1.50 (supporting), Lxx.y (attending). Info: 19 Bishop Asbury Crescent, Great Barr, Birmingham B43 6HL. North American Agent: Mary Burns, 48 Lou Avenue, Kings Park NY 11754.

23-27 August 1979
SEACON 79 (37th World Science Fiction Convention) at Metropole Hotel, Brighton, U.K. American GoH—Fritz Leiber; British GoH—Brian Aldiss; Fan GoH—Harry Bell; Toastmaster—Bob Shaw. Registration $7.50 (supporting) to 31 December 1978 $15 (attending) to 31 December 1978. Info: Seacon 79, 14 Henrietta St., London WC2E 8QJ, U. K. Talks, panels, films, fancy dress competition, banquet, the works. Join now and get to nominate and vote for the Hugo awards and the John W. Campbell Award for Best New Writer.

ANTHONY R. LEWIS

*Items for the Calendar should be sent to the Editorial Offices, **four months** in advance of the issue in which you want the item to appear.*

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the tapes because the notes have no further value. However, the notes have marvelous value for the blind, who can't attend lectures or read reports. To these Analog readers I say, Share your notes and comments with the blind. If your town has no cassette program, put the cassettes in a small manila envelope and mail it to Pinellas Blind Library, c/o Meg Alexander, 6100 62nd Avenue North, Pinellas Park, FL 33565.

Distance is no problem. Everything is Relative, right? The Library receives cassettes from as far afield as England.

In the USA, material for the blind can be mailed postage-free. All donations to the Pinellas Blind Library are tax-deductible, of course.

Naturally the blind—like all of us—prefer information to be "easy listening," but don't be afraid that technical material will be going over the listener's head. The science-interested blind are exactly like their sighted counterparts. As one blind woman remarked, "We're only *blind*—we're not otherwise handicapped."

For you triple-threat guys and gals with interests besides science, I ought to mention other information gaps. Blind-oriented travel descriptions. Biographies of the people in *this week's* news. Food recipes. Many blind are gourmet cooks, but they don't get much out of "watching" Julia Child wrestle 19 saucepans to cream a truffle.

Well, Ben, I will now—with your kind and understanding permission—settle down to tape a few of your straight-from-the-shoulder editorials. I hope all Analog contributors—fiction as well as nonfiction—will let me tape their stories and articles for the Library. Better yet, I hope the authors themselves will tape what has been of special interest to them, introducing themselves on the cassettes and expressing their personalities to the blind listener.

For an old yarn-spinner like me, taping is a lot of fun—but I hope some of you science experts take over the DNA molecules, muons, nuons, and other imaginary-particle come-ons. I mean, after I've demonstrated What Goes Up Must Come Down, I've pretty well shot my bolt.

Yours, for a new communication channel with the science-interested blind.

SAM NICHOLSON

We're happy to see people helping the blind . . . so long as those cassettes aren't used for any commercial purpose!

Dear Ben,

Since the last time I wrote the OMB has released NASA's budget for '79. I fear that Mr. Carter actually has very little interest in reaping the benefits available by exploiting outer space. The current budget shows an 8% increase over last year's, just enough to balance inflation. That by itself shows that no new programs could start, and now let's look at proposed cuts: Halley's Comet Mission is scrapped (a once in seventy-six year opportunity), space shuttle fleet will be cut from five orbiters to four, Viking rover bites the dust, Lunar polar orbiter once again passed by, reduced funds for communications and earth resources satellites, no funds

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for satellite solar power. If this is part of the administration's vigorous attack on national energy and resources problems then I am from Frolix-X. Apparently we have not been able to generate enough public support for NASA. Everyone with an interest in space write your congresscritter; maybe some of these cuts can be restored. OMB has power over budgets but no responsibility for the future, NASA has responsibility for the future but no power. It is up to us citizens to help Congress achieve a balance.

MICHAEL C. STRONG
5454 S. Linden Rd.
Swartz Creek, MI 48473

New Programs are not the only "figure of merit" for a governmental budget. The Shuttle is going on, and a fifth one can be authorized later. A roving Viking is probably a mistake, at this stage of the game. And the new Department of Energy is looking at SSPS.

Dear Ben:

For the past two years I have been conducting a Science Fiction Survey. To get more replies, this year I decided to go to the top—Analog. You, the Analog reader, can express to the world who your SF favorites are. Simply list your top ten favorites of all time in these areas: novels, novellas, novelettes, short stories, short fiction (all), characters, authors, movies, TV series, best dramatic presentation in any medium.

Mail your ballot to me by January 1, 1979. I'll mail a copy of the results to you at Analog, so you can share them with SF fans everywhere. If you would like a copy of the results when they are published in January 1979, enclose a SASE with your ballot.

PERRY GLEN MOORE
1326 Burton Valley Road
Nashville, TN 37215

Surveys are always interesting, and sometimes even useful!

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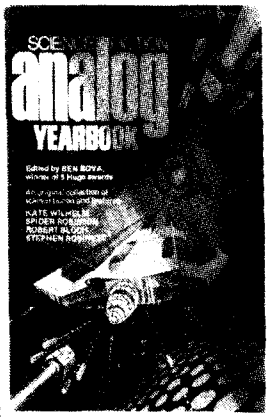

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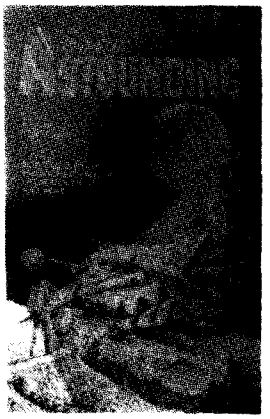

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